GAS JOURNAL, February 22, 1933.

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BRITISH INDUSTRIES FAIR.

GAS JOURNAL

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Vol. 201. 85th Year. | LONDON, FEBRUARY 22, 1933. | No. 3640. Price 1s.

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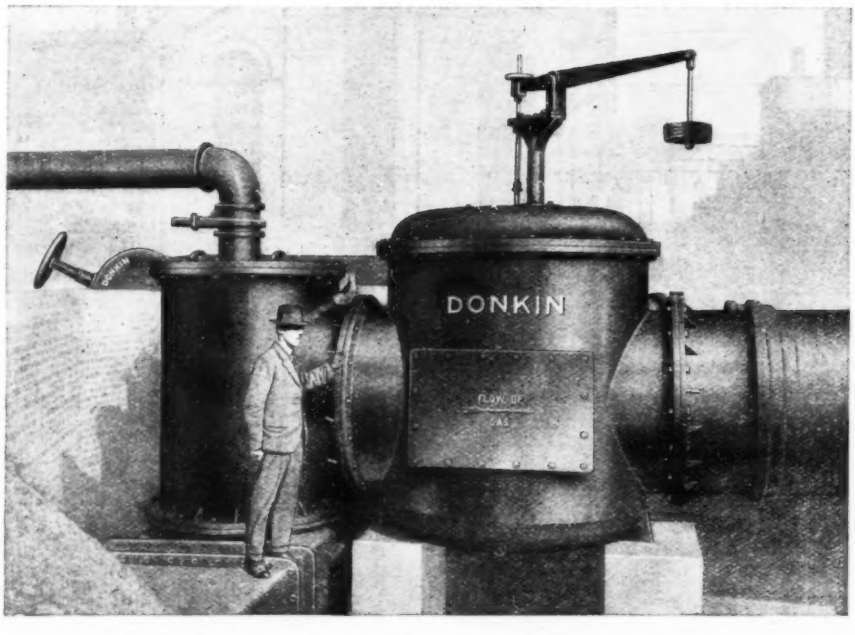

Fig. 817

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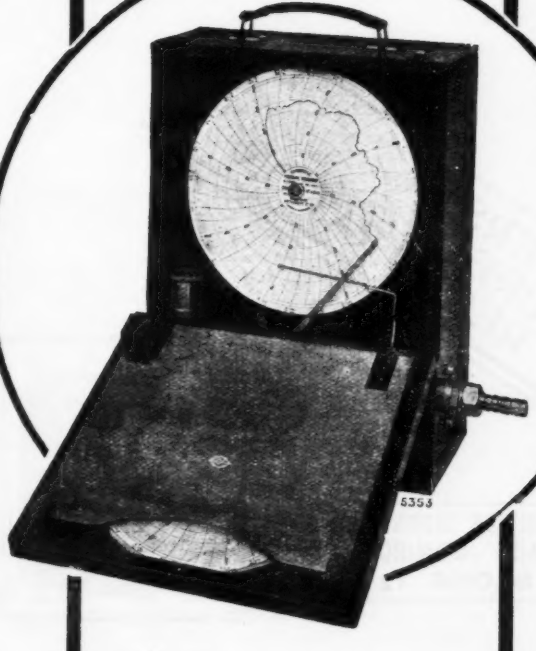

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22.

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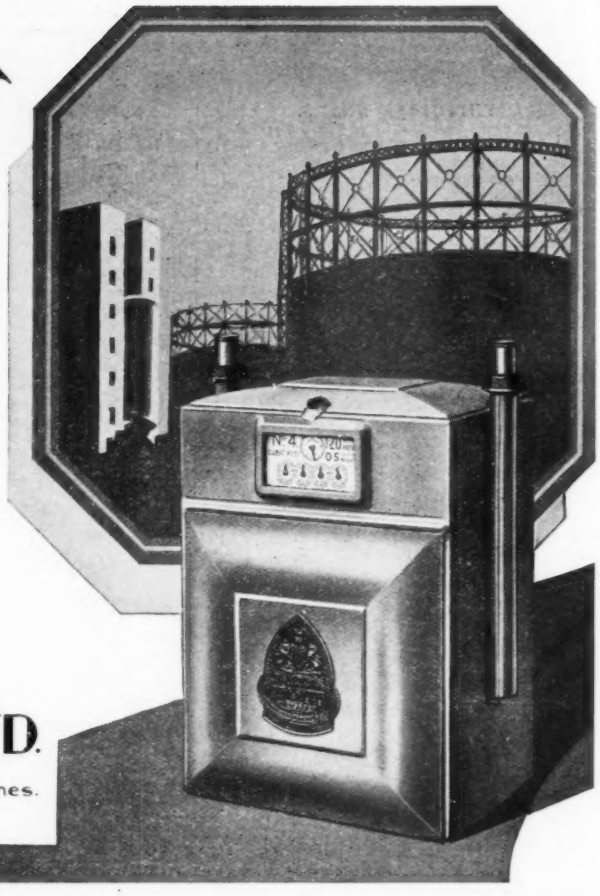

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THE GAS JOURNAL

FEBRUARY 22, 1933

Vol. 201. 85th Year No. 3640

A Glance at the Contents—

Refractories for Verticals.

In our correspondence columns to-day Mr. C. R. F. Threlfall has some useful suggestions regarding the elimination of spalling troubles in vertical retorts. [p. 459.]

Distribution at Croydon.

Mr. P. Richbell, of the Croydon Gas Company, describes the practice and appliances used by his Undertaking to ensure a satisfactory, economic supply of gas throughout the area of supply. [p. 468.]

Assistant to Distributing Engineer Required.

A Gas Company in the South of England is inviting applications for the post of Assistant to the Distributing Engineer and District Superintendent. The commencing salary is £500 per annum. [p. 507.]

Bournemouth Gas and Water Company.

The 112th Ordinary General Meeting of the Company was held at its Offices, 48, Copthall Avenue, London, E.C. 2, on Friday, Feb. 17—Mr. William Cash, F.C.A., J.P., Chairman of the Company, presiding. [p. 474.]

Institution of Chemical Engineers.

The annual meeting and annual dinner of the Institution took place on Friday last at the Hotel Metropole, London. [p. 466.]

Exhibits at the B.I.F.

An illustrated description covers all the exhibits in the Gas Industries Section of the British Industries Fair at Castle Bromwich, and also other stands at the Fair likely to prove of interest to our readers. [p. 478.]

Gasholder Explosion at Neunkirchen.

We are able this week to give a first-hand report of the disaster, prepared for us by no less eminent an authority than Dipl.-Ing. Dr. Karl Bunte. His story is a reliable and unbiased account of the tragic event. [p. 460.]

Westminster Technical Institute Extension.

The official opening of the £66,000 extension of the Westminster Technical Institute, which has long been closely associated with the Gas Industry, was performed by Lord Irwin, President of the Board of Education. [p. 473.]

Forthcoming Engagements

Feb. 24.—Official visit of Gas Salesmen's Circles to the British Industries Fair, Birmingham.

Feb. 27.—INSTITUTION OF GAS ENGINEERS.—Meeting of Gasholder Sub-Committee, 2.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Feb. 28.—B.C.G.A.—Meeting of the General Committee at 3.0 p.m. in the Bradford Room, British Industries Fair, Castle Bromwich, Birmingham.

Feb. 28-March 2.—Joint Gas Conference at the B.I.F., Birmingham.

March 4.—SCOTTISH JUNIOR ASSOCIATION (WESTERN DISTRICT).—Meeting at Glasgow. Address by Sir Francis Goodenough.

March 9.—MIDLAND JUNIOR ASSOCIATION.—Meeting. Paper by Mr. A. W. Attwood.

March 10.—MANCHESTER DISTRICT ASSOCIATION.—Annual General Meeting, Midland Hotel, Manchester, 2.30 p.m.

March 11.—WESTERN JUNIOR ASSOCIATION.—Meeting at Bath. Four short papers.

March 13.—INSTITUTION OF GAS ENGINEERS.—Meeting of Meters Committee, 2.30 p.m.

March 14.—INSTITUTION OF GAS ENGINEERS.—Meetings of Finance Sub-Committee, 10 a.m.; Finance Committee, 10.30 a.m.; Executive Committee of the Council, 11 a.m.; Gas Education Executive Committee, 4 p.m.

March 14.—N.G.C.—Meeting of Central Executive Board.

March 14.—FEDERATION OF GAS EMPLOYERS.—Meeting of Central Committee.

March 15.—INSTITUTION OF GAS ENGINEERS.—Meeting of Board of Examiners, 10.30 a.m.

March 15.—B.C.G.A.—Meeting of Executive Committee, 12 noon, 28, Grosvenor Gardens, S.W. 1.

March 16.—INSTITUTION OF GAS ENGINEERS.—Meeting of Refractory Materials Joint Sub-Committee, 2.30 p.m.

April 7.—NORTH BRITISH ASSOCIATION OF GAS MANAGERS.—Spring Meeting in Glasgow.

April 12.—INSTITUTE OF FUEL.—Visit to Beckton Coke Ovens and Greenwich "Metro-Coalite" plants.

April 19.—B.C.G.A.—Meeting of Executive Committee, 12 noon, 28, Grosvenor Gardens, S.W. 1.

May 11-12.—EASTERN COUNTIES ASSOCIATION.—Spring General Meeting at Croydon.

1933 "JOURNAL" Directory.

Page 54. PUDSEY. J. Wilkinson, Engineer, Manager, and Secretary, deceased.

Page 64. SPENNYMOOR. T. C. Whimster, Engineer and Manager, resigned.

Page 12, No. 7. HOLYWELL AND FLINT. Amalgamated figures should read: 'Phone, Holywell 140, Flint 26. Make 48·6. Sales 42·8. Consumers 2957. Coal 4356. Coke made 2688, for sale 1484. C.V. 500. Prices: Holywell 15d.,* 16·6d. *sl.*; Flint 14d.,* 15·4d.* *sl.*

EDITORIAL NOTES

Bigger and Better

ON our visit to the Heavy Section of the British Industries Fair at Birmingham, which was opened on Monday last, we were impressed by two things—first the fact that it is a bigger display than ever before; secondly, that it is a better display. This applies to the Fair as a whole, and by no means least to the Gas Industries Section, in which there are this year no fewer than 85 exhibiting firms. Never have the manufacturers of gas plant and appliances offered a wider variety of well-made goods than they offer at the 1933 Fair.

The demands of the industrialist, the commercial man, the householder are met as never before, and it is certain that the Gas Industries Section will prove a real "eye-opener" to the thousands who will visit the Fair. British visitors will leave Castle Bromwich proud of their country, and, we think, amazed with the choice of decorative and efficient appliances arranged so excellently in the Gas Industries Section.

H.R.H. The Prince of Wales,
At the Mansion House Banquet to celebrate the opening of the Fair:

We in this country feel that we are now building strongly for the future, for our trade, and for world trade. We must no longer be influenced by the bitter remembrance of the unfulfilled hopes and disillusionments of recent years. We must try to look forward with our heads up and our tails up, not with a slack optimism, but with sane wisdom, confident that our full recovery in world trade must be slow, yet the more likely it is to be certain and lasting. The British Industries Fair of 1933 is, indeed, deserving of success, because its success will be international in its effect. It will create more employment, and it will enable us to make our contribution towards the economic recovery which the whole world seeks. So let us, with all our hearts, wish success to the British Industries Fair.

A large amount of space in this Special Number of the "JOURNAL" is devoted to an illustrated description covering every stand in the Gas Industries Section, and this account will prove most useful to our readers. The exhibitors have displayed much originality and ingenuity in the lay-out of their stands. There is both individuality and unity in what is the most attractive Section we have yet seen. The general colour scheme of the Section is most pleasing and serves as an excellent background to the bright enamels, with really beautiful finishes, chromium plate, and neat lines which characterize and unquestionably assist in popularizing gas appliances of to-day. The lighting of the exhibits with high-power low-pressure gas lamps enhances the effect—once again both individually and collectively. The Gas Industries Section is truly a first-class effort, and its supporters are deserving of both praise and gratitude.

In view of our detailed description on later pages we are not going to write at any length about the Fair here, but we cannot terminate this note without mentioning two features of the Gas Industries Section which appeal to us forcibly from many points of view. One of these outstanding features is the way in which the virtues of gas for water heating are brought out. In this connection we make no apology at all for calling attention to the display staged by Radiation Ltd. The water heating load has enormous potentialities for our Industry, and it is a real pleasure to see the wide range of apparatus which the Industry and its consumers have at their command. The entire exterior of the Radiation stand is given up to one of the most comprehensive and interesting displays of hot water apparatus we have ever seen, and should provide a most heartening incentive to the Gas Industry. It is, in fact, an example of keen foresight which we should like to see followed up.

The other feature is the co-operative display of industrial furnaces and equipment. This again is a fine effort and a necessary one. It is an essential "counter-blast" to the powerful and fascinating exhibit of Shell-Mex and B.P., Ltd., who have certainly staged a dynamic display of no mean order. We could criticize this display on scores other than that fierce heat is not necessarily what the industrialist needs, but we do strongly advise those of our readers who visit the Birmingham Fair to inspect this stand of the oil industry and criticize it for themselves.

We should like a ballot taken of the views of the general public as to the most attractive section of the Fair at Castle Bromwich. We believe that more votes would be cast for the Gas Industries Section than for any other. The title of this article is fully justified.

More News from Germany

THROUGHOUT the time that has elapsed since news was received in this country of the appalling calamity that has overtaken the most modern coke oven plant in the Saar Territory, the thoughts of members of the Gas Industry of this country have been before all else centred upon the Neunkirchen Iron-Works. There has been the deepest sympathy with the sufferers from the disaster; but, in addition to this, there was in the first instance the feeling of uncertainty that was engendered by the earliest reports of the occurrence. Despatched from the stricken area as these were at a moment of indescribable confusion and stress, it was perhaps no more than was to be expected that these reports should contain statements which subsequent events proved, in some cases, to be not precisely in accord with the facts.

But very soon technical skill began to shed light upon some of the more obscure portions of the terrible picture; and we were able to include in last week's "JOURNAL" a statement from the makers of the destroyed holder. In another part of our present issue, we count ourselves fortunate in being in a position to furnish readers with a translation of a report upon the accident prepared by no less an authority than Dr. Karl Bunte as the result of a personal investigation on the spot. This report goes far in discounting some of the earlier Press statements that reached this country, and on behalf of the British Gas Industry in general, and of ourselves, we heartily thank Dr. Bunte for his ready response to a request that we made to him by cable immediately news of the explosion reached us. Searching investigations, needing considerable time for their fulfilment, will be carried out. It may, in fact, be mentioned here that two Engineers of

the Gas Light and Coke Company have already proceeded to the district. In the meantime further information has come to hand and is reproduced to-day; and this in the main corroborates Dr. Bunte's findings.

As to the disastrous occurrence itself, authentic information supplied by the Manager of the coke-ovens (Herr Direktor Mogwitz) indicates that there were three altogether distinct phases. Here is Dr. Bunte's account of them: " First of all a small explosion was observed in the holder outlet pipe. In connection with this minor explosion, the outlet valve, which was in a trench, appears to have been torn loose, and there arose a flame which reached almost as high as the holder itself, and close beside it. Obviously this flame caused considerable heating of the holder sheets, with consequent displacement and emptying of the seal, so that gas entered the vacant space above the piston and an explosive mixture was ignited by the heated walls. As not a single piece of the shell remains, it is clear that, in turn, air must have entered below the piston and have produced there also an explosive mixture." The third phase was a flash-back of the gas in the main to the benzole extractors, resulting in ignition of the wash-oil in two of the towers. What happened in the main explosion (caused by the enormous flames) is clear.

Everything brought to light up to now goes to show, as was stated last week, that the holder itself was not the primary cause of this devastating catastrophe, which " constitutes one of the most serious technical disasters which Germany, and indeed the whole world, has ever experienced."

Allaying Anxiety

With so large a number of holders of the " waterless type " now in existence, some anxiety on receipt of the first reports of the calamitous accident at the coke-oven plant of the Neunkirchen Iron-Works was no more than could have been anticipated, and no stone will be left unturned by the Gas Industry to set at rest even the most far-fetched fears and doubts.

It was stated in the preliminary report from Germany which we were enabled, through the courtesy of the Waterless Gasholder Company, Ltd., to reproduce in last week's " Journal," that the holder of the M.A.N. design which was involved at Neunkirchen had worked with entire satisfaction until the last moment; and now we are told by Dr. Karl Bunte, in the article which is published on a later page (and which fully accords with the earlier view that the holder itself was not the primary cause of all that happened) that " the holder was visited several times daily, and the manometer showed no disturbance whatever in its working."

Mr. J. R. Willis Alexander, the Secretary of the Institution of Gas Engineers, has been interviewed by " The Times," which paper subsequently stated that events at Neunkirchen were receiving the active consideration of the Gasholder Committee of the Institution, who, in accordance with customary procedure, would thoroughly investigate the causes. Mr. Alexander pointed out in the interview that gasholders in this country are regularly inspected, and that " there is little fear of an accident occurring. Under the gasholder inspection and maintenance schedules issued by the Institution, provision is made for a daily inspection of holders and for a record to be kept of such inspection." In this connection, he drew attention to the facts that all the moving parts of a holder of the type now in question operate in a position sheltered from the weather, and all working parts can be inspected at any time while the holder is in operation. He also explained the means taken to ensure effective sealing of the space between the piston and the walls of the cylinder.

In the correspondence columns of the same paper, Lt.-Col. J. T. C. Moore-Brabazon had made inquiry as to the relative safety of the waterless and the water-sealed designs of holder. Lt.-Col. Brabazon asked whether it is possible for there to be an explosive mixture in the top of the waterless type of gasholder, and in reply Mr. Robert Perkins, M.P., wrote: " To reassure him on this point I may mention that pigeons regularly nest and rear their families in the large holder near Heston. If Colonel Moore-Brabazon needs further conviction I am perfectly willing—with the permission of the owners, of course—to take him over this gasholder and spend the night inside while the holder is in operation." Mr. Perkins pointed to the large number of these holders working in all parts of the world, and to the fact that this number includes " the world's largest gasholder of any type."

Mixing and Blending

In these columns last week we referred briefly to the extraordinarily interesting paper on the carbonization of screened, mixed, and blended coals read by Mr. H. Hollings, of the Gas Light and Coke Company, at a joint meeting of the Institute of Fuel and the Manchester District Association of Gas Engineers. The Company have already done much large-scale work on blending, and have shown how by blending caking and non-caking coals the rate of throughput in continuously operated vertical retorts can be greatly increased and the working conditions made steadier and easier. The two blending and mixing plants now being erected at the Company's Beckton and Southall Works, however, when put into operation will take this problem of blending very much further and will, we believe, really put the Gas Industry in a position to manufacture suitable cokes for particular purposes. Of course, the Industry has not been idle during the past ten years on the question of screening and coke preparation under economical gas-making conditions, and Mr. Hollings cites the notable examples of Portsmouth, Liverpool, Dawsholm, and Birmingham; but in all these instances true blending—as distinct from screening and mixing—has not been practised. There is a vast difference between mixing coals and blending coals; and the author confines the term " blending " to those cases in which the constituent coals, and coke if any, are crushed completely below $\frac{3}{4}$ in.

The installations at Beckton and Southall will definitely be screening and blending plants, and the Southall plant incorporates not only a briquetting unit but also a low-temperature carbonization unit, so that blends of coal and semi-coke can be treated. Indeed, the possibilities before the two plants are enormous; they will render it possible to test on a large scale several alternative processes, and we are sure that the net result will be lower fuel costs for carbonization, longer life of carbonizing plant, and really first-class cokes. The Beckton plant is nearing completion, and when it comes into operation it will screen Durham gas coal so as to separate nuts above 1 in. in size for transport to other works of the Company where they will be carbonized in continuously operated verticals, and to permit of blending the fine coal with other coals for carbonization in coke ovens. Both the Beckton and the Southall installations, which were diagrammatically illustrated in our issue last week, are planned with great skill.

The discussion on the paper, a report of which we also published in the " Journal " last week, is full of useful suggestions, and all the views expressed entirely support the Gas Light and Coke Company's policy in erecting these two blending plants—the results of which, to quote Col. W. M. Carr, " will be of untold value to all engaged in the carbonization of coal." Blending, besides its effect on the quality of the coke produced, can have such a marked influence on the economics of gas manufacture. As to coke quality, it must not be forgotten that a large field exists for central heating and small domestic hot water work in closed apparatus which demand a fuel of high density; and the economic effect of blending on density, considering that more than half the coke made by our Industry to-day is produced in continuous vertical retorts, may well be of the utmost importance. Whether the aim is to produce coke for the open firegrate or fuel for the closed boiler, however, one thing is certain—that one of the primary factors influencing its popularity is the ash content of the coal originally used. A good coal for a blending plant is first and foremost a coal of low ash content. Marked improvement in coal cleaning methods adopted by the collieries has taken place of late years, as is evidenced by practically every recent paper on the subject of carbonization, but even now the difference between the practice of one colliery and another is too great. With a modern washery there is no reason

why coal should not be cleaned with a minimum of loss in the refuse. It is not a paying proposition to put into a carbonizing plant any ash that can be removed beforehand. Anything the Gas Industry can do to influence the cleaning of coal at the pit-head will be not only in its own interests but to the ultimate advantage of the coal industry generally; clean coal is cheaper in the long run.

The reason for incorporating a low-temperature unit in the Southall plant is bound up with this question of ash content. As explained by Mr. Hollings, in the London area it is not easy to secure at an attractive price suitable non-caking coals in quantities such as are required. It is often supposed that enormous supplies of cheap slacks are available. It has been found, however, that many of these are unsuitable for the manufacture of high-grade coke because of their high ash content. It is important, therefore, to consider how the available supplies of suitable coal may be conserved, and it is found that if they are first carbonized at a low temperature the quantity required for making up a given quantity of blend is reduced. In other words, the ratio of caking to non-caking coal is increased.

Refractories for Verticals

THE attention of our readers is called to an important contribution to our correspondence columns to-day. The letter in question is by Mr. C. R. F. Threlfall and concerns the subject of refractories for verticals and deals among other problems with the matter of spalling—in which connection Mr. O. A. Ternes, of Melbourne, had some interesting comments in the "JOURNAL" for Jan. 18 last. Commenting on Mr. Ternes' paper we suggested that the author was a little too pessimistic in his attitude towards silica and spalling. Our correspondent to-day agrees with our view, and maintains that experience in this country shows that silica is not quite as vicious a material as Mr. Ternes would have us believe.

In the vertical retort the spalling is local, or zonal, and confined to a belt not more than 5 ft. deep. It would seem, therefore, that expensive refractories such as Sillimanite might be used economically, since only a small percentage of non-spalling refractories would be required; moreover, states our correspondent, the cost of refractories in a vertical retort is only 3 to 4% of the total cost of the retort; and the additional cost of the small amount of non-spalling refractory would not be the "almost prohibitive" increase which Mr. Ternes mentions. We do not in the least hoodwink ourselves about the spalling of silica at high temperatures. We are aware that this does take place, but we do think that a way out of the difficulty can be found, as we said in these columns in our issue of Jan. 18. And we thoroughly agree with our correspondent that, if the right ones could be found, the use of costly refractories would be an economic proposition in the long run.

We also appreciate that sitting in an office in Fleet Street writing about refractory materials is quite different from shouldering the responsibility of lighting-up and running a bench of vertical retorts constructed of silica. We have not yet arrived at a decision, however, as to which is the harder task. Experience on the plant, though, makes us feel that this question of refractory materials for vertical retorts is definitely in a "state of flux," that Mr. Ternes' pessimism is not wholly justified, and that the suggestions advanced by Mr. Threlfall are worth much more—by a long chalk—than mere casual notice.

PERSONAL

Mr. ERNEST G. BROOKS, who was successful in gaining the first prize (bronze medal) of the City and Guilds of London Institute in the 1932 intermediate examination in Heating and Ventilating, is the son of Mr. Frederick Brooks, Assistant Manager to Thomas Potterton (Heating Engineers), Ltd. He commenced his training with a three years' course at the School of Building, and afterwards entered Messrs. Potterton's works, where he went through a full course including workshop practice in the manufacture of plant. Subsequently he gained outside experience in the erection of all classes of heating apparatus, and during this time he was studying at the Borough Polytechnic. At present he occupies the position of Technical Assistant to Messrs. Potterton.

As a result of this success, Mr. Ernest Brooks has been awarded a prize of £2 by the Institution of Heating and Ventilating Engineers, and he also becomes qualified thereby for admission without examination as a Graduate Member of this Institution.

At the February meeting of the Wigan Gas Committee reference was made to the pending retirement under the Superannuation Act, on June 3 next, of Mr. F. BETLEY, Gas Engineer. Mr. Betley commenced his association with the Corporation's Gas Undertaking on Feb. 22, 1883, and on Feb. 21 will have completed 50 years' service. Mr. Betley has occupied the position of Gas Engineer for the past 21 years. Previously he was Assistant Gas Engineer for a period of six years.

* * *

Mr. W. B. MCLUSKY, Junior, who last year resigned his position with the Parkinson Stove Company, Ltd., has now taken up his duties as Sales Manager for Scotland, Northern Ireland, and the North of England for Sidney Flavel & Co., Ltd., stove makers since 1777, of Leamington. Mr. McLusky was originally on the technical staff of the Halifax Corporation Gas Department, and after a distinguished War Service, having attained the rank of Captain and received the Military Cross and Bar, returned to the Gas Industry, thus having been associated with it all his life.

Opening of the Fair

For the first time in the history of the Fair, the opening ceremony was performed by a member of the Royal Family. The Duke of York, who so graciously undertook the task, visited the Gas Industry Information Bureau, where he was introduced to Dr. E. W. Smith, C.B.E., Chairman of the Gas Industries Section Committee, and also to Mr. W. L. S. Spinks, Hon. Secretary of the Committee. The Duke was the first to sign the Visitors' Book on the Information Bureau this year. The Duke of York also spent a considerable time in the new industrial portion of the Gas Industries Section, where Dr. C. M. Walter explained the new developments which have been made in regard to the bottling of compressed gas. His Royal Highness used a 'bus running on compressed gas to take him from one end of the Fair to the other.

In his speech at the Inaugural Luncheon, the Duke referred to the recent brochure issued by the Incorporated Sales Managers' Association, mention of which was made in the "JOURNAL" last week, p. 368; and Mr. Peter F. Bennett, O.B.E., President of the Birmingham Chamber of Commerce (who took the chair at the luncheon), spoke at some length of the work of Sir Francis Goodenough.

CORRESPONDENCE

Refractories for Verticals.

SIR,—The paper written by Mr. O. A. Ternes, of Melbourne, extracts from which are published in the "JOURNAL" for Jan. 18, 1933, lets in a ray of light to one of the darkest corners of the Industry.

The whole question of refractories is of such importance to the Gas Industry that Mr. Ternes' strictures cannot be allowed to pass without reply. Generally speaking, no industry has done more or could do more to encourage improvement in refractories. No industry has benefited more from the improvements which have taken place; and yet no industry is more tolerant of its refractory troubles. And this is the crux of the matter. In the last decade the refractories field has changed from a simple panorama to a glittering kaleidoscope of bricks of varying materials and properties and prices. The range of selection has grown infinitely wider.

The Melbourne experience has been singularly unfortunate. They have suffered to the full the two great drawbacks to the use of silica material in verticals, each in its most virulent form. The experience of English engineers, who have enthusiastically (I might say too enthusiastically) adopted silica, would seem to show that it is not quite as vicious a material as Mr. Ternes would have us believe.

If I may express a purely personal opinion, I would say that the high temperature (scurfing) spalling is primarily due to the high porosity of the bricks, though the factors which cause spalling are debatable. The porosity is a very good indication of the internal strength of the brick. There is no doubt that in bricks made from non-plastic materials like quartz, silica rock, calcined fireclay, or grog, the strength of the brick varies inversely with its porosity, while its powers of resisting spalling follow its strength. High porosity indicates bad bonding, and structural weakness; and nearly all commercial silica bricks have a comparatively high porosity. I believe that all attempts to manufacture non-spalling silica bricks have resulted in the production of bricks with a porosity below normal—but possibly at a considerably increased price—and it may well be that the general production of low-porosity silica bricks is neither an economic nor a practical proposition. The porosity of commercial silica bricks varies between 25% and 30%. If the figure could be reduced only as low as 22% I am quite certain that a lot of the spalling troubles would cease.

The fact that the spalling is local (or zonal) and confined to a belt not more than 5 ft. deep does mean that the most expensive refractories can be used economically, since only a very small percentage of non-spalling refractories would be required. The extra cost of Sillimanite in the spalling zone would not be more than £10 or £15 per retort, which does not amount to the "almost prohibitive" increase which Mr. Ternes mentions.

In a vertical retort installation costing from first to last round about £1000 per retort to install, the cost of the refractories in the retort itself will not be more than £40, and probably nearer £30, depending on the type of retort and material used—say, 4% to 3% of the cost of the installation. A retort will turn out some £10 worth of saleable material (gas, coke, &c.) per day—*i.e.*, the retort turns out in three to four days enough saleable stuff to pay for all the retort materials. From this it would appear that quality and performance must be the only possible criteria, and that the question of initial cost should not arise.

Sillimanite bricks would not, however, in my opinion, be successful unless they conformed to the specification for porosity which I have just laid down for silica. It is important above all else that they be well and truly bonded, and hard, strong, and tough—that is to say, they must be really good bricks and not merely bricks made out of a good material. Like the proverbial woman and dog and walnut tree, the harder the firing they get the better they be, due to the felt-like growth of mullite crystals throughout the mass. With heavy firing their "nature" improves rather than weakens. Their expansion up to 1400° C. is below 0·1%. which amounts only to $\frac{1}{8}$ in. in the 5 ft. belt, and the expansion curve is a straight line without any critical points.

I can visualize the day when all vertical retorts will be of composite construction embodying three types of refractory, and silica is not one of these three. Still, whether the material be Sillimanite, chrome-silica, or what you will, the fact remains that the use of costly refractories (could the right ones be found) is definitely economic.

To my mind, the much more serious problem in silica retorts is the expansion, where Mr. Ternes' figure of 3½ in. vertically for the setting would appear to be about normal. Nobody can deny the manifold difficulties which are caused by its expansion. The general use of silica is merely an indication that engineering ability has managed to overcome these difficulties to an extent sufficient to yield a slight balance in its favour. The good points about silica are refractoriness, strength under load, and resistance to certain types of ash or slag (and, to a lesser degree, its conductivity). If other refractories are used in the high-temperature critical zone, then all these three good points become of less value, but its worst points will still persist. The low-temperature expansion of silica is the devil. It is fundamental in origin and devastating in action. It is responsible for the incredibly long periods employed in lighting up the settings; it is the cause of all the jointing troubles at present so prominently before the Industry, and, however great the ingenuity displayed, it renders a sound monolithic construction impossible. It cannot be tied in to other non-expansile and stable bricks or metal work, and cases have occurred where sound retorts constructed of other materials have been wrecked on lighting up, owing to their having been tied in to silica walls.

It is high time that engineers generally got this question of conductivity in the right perspective. Below 1200° C. silica is definitely a worse conductor than common fireclay; above 1200° it is a better conductor. But both silica and fireclay are exceedingly poor conductors. The rate of flow of heat through a refractory wall depends far more on the velocity and temperature of the gases on each side of the wall than on the character of the refractory material employed. To my mind, in the average gas retort, bench temperature is the dominant factor. No difference will be observed between fireclay and silica retorts if both are worked at the same temperature and with the same gas velocities.

To the Industry generally, buying its refractories in the cheapest market, as it does, the word "Firebrick" has come to mean something with a P.C.E. value of 29-30 and a maximum safe-working temperature of 1250° C. or less. If temperatures in excess of this are contemplated, the Industry turns automatically to silica as the only possible alternative material. And this is a grave mistake. The last decade has seen an enormous advance in the understanding of refractories and in the technique of manufacture. To-day, from many sources, firebricks are obtainable which have largely the good characteristics of silica (to a lesser degree certainly, but no less certainly to a sufficient degree) yet lacking the silica expansion bogey. Such firebricks are quite capable of giving long and faithful service at temperatures up to 1450° C., and by their use the idea of bottle-tight retorts and chambers is achieved. They have a refractoriness nearly, if not quite, equal to that of silica, and their resistance under load is some 200° C. higher than that generally assumed by the Industry for an ordinary firebrick, resisting under laboratory conditions a load of 50 lbs. to the square inch up to 1500° C. They have little or no expansion, and will not shrink until exposed to temperatures above 1500° C. As a rule they contain something over 40% alumina, and may be used comfortably in vertical retorts working with combustion chamber temperatures up to 1450° C., with a sufficient margin in case of accidentally higher temperatures being attained.

Though Mr. Ternes does not mention it, one of the gravest troubles of all in silica verticals to-day is the difficulty of getting a jointing cement which will combine adhesion, elasticity, and refractoriness to such an extent that it will be neither melted or fused away by the temperature, nor disrupted by the expanding brickwork, but this trouble can be got over by the use of fireclay bricks of the type mentioned above.

Twelve weeks to get a setting up is a stupendous period—a quarter of a year, a large slice out of the working life of the setting. The time required for lighting up depends largely on the expansile nature of the bricks in the setting, so that a minimum expansion means a maximum flexibility of operation. If the right types of refractory are chosen, a fortnight should be ample for lighting up.

Gas makers cannot be expected to know all about refractories any more than refractory makers can be expected to know all about gas making, but if Mr. Ternes' paper leads the Gas Industry to a general survey of the whole refractories field, he will not have written it in vain.

Yours, &c.,

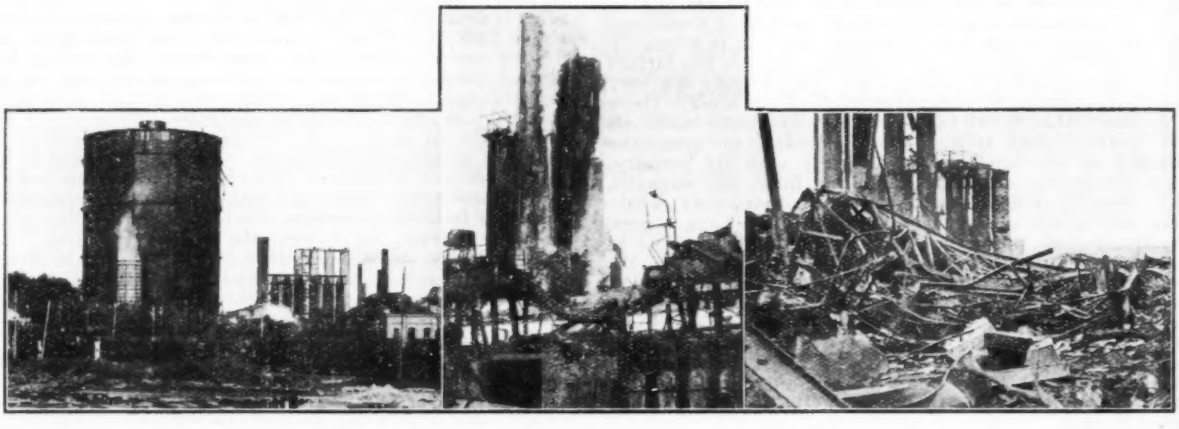
C. R. F. THRELFALL.

Kidderminster,
Feb. 12, 1933.

The Gasholder Explosion . . at Neunkirchen . .

We are able this week to give a first-hand report of the disaster, prepared for us by no less eminent an authority than Dipl.-Ing. Dr. Karl Bunte, a.o.

Dr. Bunte's fame in the Gas Industry spreads far beyond Germany, where he has long been a leader, and where now he is Chief of the Karlsruhe Research Institute of the German Gas Association. He was on the scene of the disaster immediately after its occurrence, and the following is a translation of his most interesting story, illustrated by his own notebook sketch of the scene. It constitutes, therefore, a thoroughly reliable and unbiased account of the tragic event.



View before the explosion. On the right of the holder can be seen the condenser and benzole plant. *Wrecked portions of the roof and of the piston seal lying on the foundations.* *Showing damage to the old battery of ovens, and behind them the condenser.*

A calamity of almost unbelievable magnitude has befallen the most modern coke works in the Saar Territory—the Coke Ovens of the Neunkirchen Iron Works (late Stumm, now belonging to the Otto Wolf Group). The deepest sympathy has been expressed in all quarters, for, humanly regarded, the Neunkirchen explosion, with 80 deaths and some 350 injured in hospital, constitutes one of the most serious technical disasters which Germany, and indeed the whole world, has ever experienced.

The technical man, who regards the results of the catastrophe with the deepest concern, is speechless in face of the power of the forces of nature which broke their bonds, and is naturally eagerly seeking the causes in order to be able to avoid any future recurrence of the kind.

The wrecked holder was of the M.A.N. Waterless Type of 120,000 cub.m. [approx. 4½ million c.ft.]—one of the largest on the Continent, and it was only brought into action in the year 1931. It had a height of 75 m. [about 248 ft.], and with the roof and ventilator a total of 87 m. [287 ft.]. At the time of the accident it contained 15,000 cub.m. [say 530,000 c.ft.] of gas, so that the piston was at a height of approximately 8 to 10 m. [26 to 33 ft.]. The holder was visited several times daily, and the manometer showed no disturbance whatever in its working.

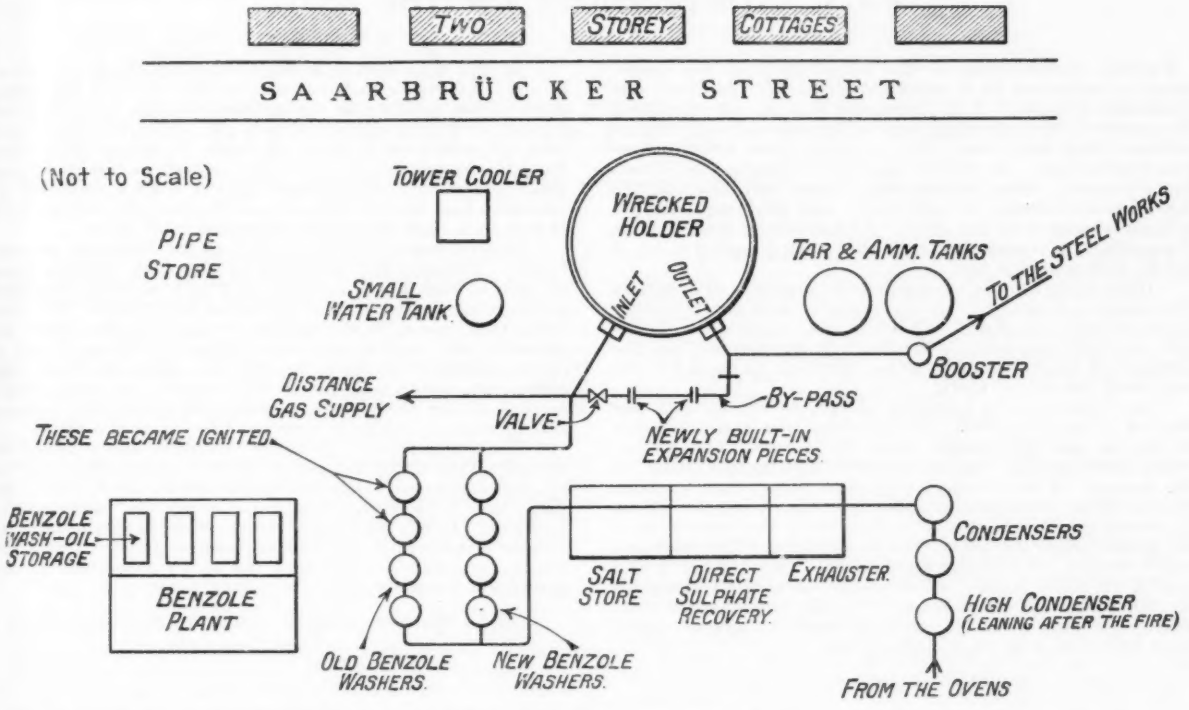
The gas was brought from the exhausters through the ammonia saturator and the benzole washer to a branch which was situated in front of the holder from which in one direction it could be sent for the distance supply of the Homburg Works of the Neunkirchen concern, and in the other through a by-pass past the holder to a compressor for the supply of the Neunkirchen local steel works. Normally the holder was not in circuit with the main gas stream, but was used as stand-by storage. The by-pass had recently shown a considerable loss of pressure due to naphthalene deposits, and was in consequence out of use and shut off by a valve on the inlet side for the purpose of building in expansion pieces with a view to steaming out the deposits. During the whole of this time gas was passing through the holder, and the outlet was cut off from the by-pass.

In connection with letting in the expansion pieces, work had been done on the by-pass in the preceding days with cutting and welding lamps without any untoward occurrence. The work of building them in was completed, and all was ready for re-connecting the by-pass to the holder outlet.

Contrary to statements in the daily Press, it must be quite clearly stated that this work with the cutting and welding burners in the vicinity of the holder could not on any account be condemned on technical grounds, since the warming of sealing oil before pumping was normally effected by means of open flames.

As regards the accident itself, there were, according to authentic information supplied by the Manager of the Coke Ovens, Herr Direktor Mogwitz, three quite distinct phases. First of all a small explosion was observed in the holder outlet pipe, the origin and course of which can no longer be decided. In connection with this minor explosion, the outlet valve which was sunk in a trench appears to have been torn loose, and there arose a flame which reached a height of about 70 m.—that is to say, almost as high as the holder itself and close beside it. Obviously this flame caused considerable heating of the holder sheets with consequent displacement and emptying of the seal, so that gas entered the vacant space above the piston and an explosive mixture was ignited by the heated walls. As not a single piece of the shell remains, it is clear that in turn air must also have entered below the piston and have produced there also an explosive mixture.

The third phase which was indicated in the daily Press as a further threatening danger was that pieces of material blown from the holder fell in the benzole extractors which were situated about 20 m. away, and the gas became ignited there. What actually happened was that, after the



DR. BUNTE'S ROUGH NOTEBOOK SKETCH, FROM WHICH HIS REPORT CAN BE EASILY FOLLOWED.

(*Not to scale.*)

gas was turned off combustion spread back to the washers, so that these were burning internally, which they continued to do until February 13. There was a danger that these high washer towers might fall sideways on to the wash oil and benzole storage tanks, where further fires might have followed. The large air condenser was also struck by a piece of flying material and set on fire. The tower was so strongly heated that it became inclined to one side.

The report appearing in the daily Press is incorrect in saying that benzole in the filling station was ignited, as is also the report that the benzole storage tank exploded. In actual fact, it is still full of benzole, and quite intact, although neighbouring cottages were set on fire.

What happened in the main explosion which was caused by the 70 m. high flames is therefore comparatively clear. But up to the present there is no light on the origin of the minor preceding explosion which gave rise to the serious escape of gas.

The present anxiety of the management is as soon as possible to take gas again from the coke ovens, and even without ammonia and benzole extraction to supply it to the steel works, as upon this depends the possibility of getting the coke ovens to work again. At present they have had to be completely shut down. The management hope to be able to do this within a few weeks. For the distance supply to Homburg and Ottweiler, the Saar Long Distance Company is planning to bring a connection from the western main of their system through Altenwald-St. Ingbert into the Neunkirchen-Homburg main.

The technical world remains deeply shocked by a calamity which in the gigantic proportions which it assumed equals the worst which have hapened in mine or on the sea.

AN OFFICIAL VIEW.

The "Neunkirchener Zeitung" for Feb. 16 published an article based upon investigations carried out by the Gewerbeaufsichtsamt Saarbrucken—a permanent official body which might be described as an Industrial Supervisory Council. A translation of their report has been passed to us by the Waterless Gasholder Company, Ltd., as follows:

"It has been repeatedly stated in the Press that the explosion of the gasholder had been caused by the near-by benzole factory. These reports are not correct. The investigations made so far show that the benzole factory, as well as the filling station which was close by the gasholder, had no connection whatsoever with the cause of the accident. In fact it can be said from evidence of eye-witnesses so far taken that the first and moderately small explosion which later resulted in the big gasholder explosion took place in the by-pass main of the gasholder. This by-pass main had no connection either with the benzole factory or with the filling station. At the time of the small explosion this main was not in operation, as work was being done on it.

"It is possible that, through some leakage invisible to the man working on the main, gas entered the main. This gas could have been exploded through a blow with a hammer on the part of a workman. The minor explosion actually took place at a moment when a workman gave a heavy blow with a hammer on the head of a support on which the by-pass rested.

"With regard to the further result of the explosion, hardly any uncertainties exist. The development was as follows: Through the minor explosion in the by-pass main, the outlet main from the holder, which was directly coupled to it, was smashed not far from the point where the outlet main entered the holder. Through the opening thereby caused in the holder, gas escaped from it. This gas, as it escaped, was ignited either through the flame of the first explosion, or through sparks caused by the tearing up of the main. As a great deal of gas escaped—the opening being 65 cm. [26 in.] large—a large flame resulted, which rose up against the side of the holder, and to a greater height than the position of the piston inside the holder. This flame played up the side of the holder for about 5 minutes, and the comparatively thin sheets making up the holder shell became red hot. This caused the seal between the piston and the shell to become ineffective, so that gas escaped from the gas chamber into the upper part of the holder shell, which contained air. An explosive gas and air mixture was formed, and became ignited by the red hot shell of the holder."

M.A.N. INVESTIGATIONS ON THE SPOT.

Further confirmation of the actual facts of the occurrence is contained in a report received by the Waterless Gasholder Company, Ltd., from the M.A.N., co-ordinating the result of their investigations on the site and any reliable evidence they have been able to gather, and drawing certain conclusions. It will be appreciated, state the Waterless Company, that neither this report nor that of the Gewerbeaufsichtsamt is conclusive, and that inquiries are still proceeding with the object of establishing further facts if possible. A translation which has been supplied to us of the M.A.N. report reads:

"With regard to the causes and the sequence of events in the disaster, a number of assumptions and contradictory rumours have circulated. Without going into these in detail, we will lay down what may be considered, on the strength of the information so far received, to be in accordance with the actual facts.

"The holder had a capacity of 120,000 cub.m. and was erected in the year 1931; the diameter was approximately 50 metres and the height about 80 metres. The holder, which until the last was in excellent working condition, at the moment of the accident contained about 15,000 cub.m. of gas. The pressure distribution in the mains showed no abnormal conditions, so that no trouble in the movement of the piston inside the holder can be assumed. The inlet and outlet mains, of a diameter of 1200 mm. [about 4 ft.] placed at right angles, were connected outside alongside the holder by a by-pass main. In this, naphthalene stoppages had appeared. In view of these stoppages repair work had been done on the gas mains.

"At the time of the accident the following was ascertained: At first a minor explosion was seen on the outlet main of the holder. In connection with this first explosion the outlet valve, which was in a pit, appears to have been torn off, and then a flame of about 70 metres high burst from the broken point practically as high as the holder and right against it. This flame burned 4 to 6 minutes. It therefore had time to heat up and damage the holder shell. It was then that the second explosion took place.

"This evidence of facts leads us to the following assumptions:—Through the influence of the very intense flame 70 metres high for a duration of 4 to 6 minutes, the shell plates must have lost their power of resistance. It is probable that, owing to the tension in the shell due to the gas pressure, the shell plates were seriously deformed and in parts perhaps even torn, so that an explosion could take place both above and below the piston. As not a single section of the shell has remained, air must have entered and formed an explosive mixture also below the piston.

"The events leading up to the explosion which caused the 70 metre high flame against the holder are therefore cleared up, and it is proved that neither the holder itself, nor its design, nor its working conditions were the cause of the accident. It has been ascertained without doubt that the trouble approached the holder from outside. The result would undoubtedly have been the same in the case of any gasholder, irrespective of the system employed.

(Sd.) MASCHINENFABRIK AUGSBURG NURNBERG A.G.,
Werk Gustavsburg."

AN ACCOUNT OF THE EXPLOSION TRANSLATED FROM "DAS GAS- UND WASSERFACH," 1933, **76**, 120 (FEB. 18).

Deep sorrow and sympathy will be felt in the German Empire and in circles far beyond it at the death, so far, of 56 victims of the disaster, and at the very much greater number of casualties, many of whom have been severely injured. The disaster, the severity of which has never been surpassed in the case of a holder in actual use [the Pittsburgh disaster occurred during work on a disused holder which was being reconditioned (see "G.W.F.," 1927, p. 1228)] demands that every endeavour should forthwith be made to trace the cause of the occurrence.

The inquiry has, up till now, Feb. 13, been delayed. It is now established that, after work on the mains coupled to the holder had been finished on Thursday, the day before the accident, there was still work proceeding on Friday evening in the trench of the main taking the gas from the holder when, at 6 p.m., an explosion occurred. At the holder there are two trenches, one for the gas inlet main, the other—the one involved in the explosion—for the gas outlet. From this, there is a by-pass to the inlet main. Between the valve which controls it and the holder, a main branches off and supplies gas for the gas engines of the steel-works blowers. This had been put out of commission and taken apart in order that, as has been ascertained, naphthalene blockages, which could otherwise not be got at, might be removed. Sealing off had to be effected by the insertion of a blank flange at the position where the main leading from the holder branches off.

In the re-assembling of the main, expansion sockets had been inserted and everything had been completed with the exception of the removal of the blank flange. This work was accomplished without the presence of an engineer or foreman to look after the workmen. With one exception, all the men engaged on it were killed by the explosion which took place in the trench. The survivor has only just been able to be questioned, but his account lacks the lucidity which is desirable. There is, however, no doubt but that the removal of the blank flange was difficult. According to the works manager, there is a possibility that the workmen may have used a blow lamp.

The explosion resulted in the shattering of portions of the main. A column of flame rose up from the trench alongside the 250 ft. high holder almost to the height of its top. The assistant works engineer at once gave instructions for shutting off the holder outlet main to the street main running to Homburg and situated about 130 ft. away. The inhabitants of the neighbouring houses, warned by the explosion and flames, hurried into the streets, a proceeding which, according to several witnesses, occupied a period of 4-6 minutes. Suddenly a second and larger explosion occurred and this destroyed the holder completely and the neighbouring sections of the town of Neunkirchen over a wide area.

The essential events are explained as follows: Work was proceeding in the trench directly connected to the holder and carrying the holder outlet main, and through this the initial explosion was caused. It is also beyond doubt that it and the powerful flame of the burning gas damaged the holder and the explosion of the M.A.N. holder of capacity 4·2 million c.ft. and erected in 1931 resulted, its contents at the time of the disaster being, however, only 530,000 c.ft. It is definite that right up to the disaster the holder was in perfect condition and its piston was moving freely.

This is not the place to speak of responsibility for the occurrence of the first and smaller explosion, and this account can only serve to give the assurance that neither the holder nor any defect in it was responsible. Hence there need be no fundamental fears in the case of other holders, though it must always be insured that no work is carried out in the trenches of holder inlet and outlet mains without the strictest precautions, such as are standard in gas-works practice, to exclude any danger of ignition.

The gas supply to Homburg (Saar) and Ottweiler which obtained their gas from the destroyed holder will, it seems likely, already have been re-instated by the time these lines are in the hands of our readers, the first by means of a connection with the main from the Altenwald Colliery leading to St. Ingbert, the other by starting up the shut-down Wiebelskirchen Gas-Works. Neunkirchen meets its own requirements for gas by its own make to by far the greatest extent and, moreover, only needs a small amount of peak load gas.

We are indebted for the above account to a long-distance telephone report from Herr Direktor Fleisch, President of the Middle Rhenish Association of Gas and Water Engineers, who proceeded immediately to Neunkirchen to the scene of the disaster.

THE NEWS OF THE WEEK

As Part of a Modernization Scheme Bo'ness Gas Light Company have installed a carburetted water gas plant at their works at a cost of £2000.

The Royal Society of Arts Tenth Annual Competition of Industrial Designs, 1933.—Particulars of this Competition, in which scholarships and prizes to the value of £1500 are offered, are now available from the Secretary, Royal Society of Arts, John Street, Adelphi, W.C. 2, price 4d. net.

A Comparison.—According to a statement made by one of our national dailies, Mr. St. John Ervine, speaking at the Royal Society of Literature, said "the difference between the theatre of fifty years ago and the theatre of to-day was equal to the difference between gas and electricity." We read to-day a good deal about the troubles of the theatre!

The Fourth of a Series of Lectures to the Outdoor Staff of the Sheffield Gas Company took place on Friday last, when Mr. Arthur Forshaw, M.Sc., Chief Chemist to Messrs. R. & A. Main, Ltd., gave an address on "Gas Fire Development." About sixty members, of the Distribution Department principally, were in attendance and followed the lecture with the keenest interest, while many joined in the discussion at the conclusion.

Lengthy Family Service.—A notable record of family service with one Company is revealed by the death of Mr. John Sloan, who was a labourer employed at the Grantham Gas-Works. He was aged 61 years, and single. He had been in the employ of the Company for forty years. At the funeral the representatives of the Gas Company included Mr. J. E. Young, Manager, and a wreath was sent by the co-partners of the Company. Deceased's father, the late Mr. Alex. Sloan, served the Company for forty-one years, and the youngest son, Mr. David Sloan, who is a meter inspector, has been with the Company for thirty-two years, or a total family service of 113 years.

Royal Visits to the B.I.F.

Members of the Royal Family have always taken the keenest interest in the British Industries Fair since its inception, and this year is no exception to the rule, several Royal Visits having been provisionally arranged.

Yesterday morning (Feb. 21) H.M. the Queen, accompanied by the Duke and Duchess of York, Prince George, and the Princess Royal, visited Olympia. To-day Her Majesty inspects the White City Section of the Fair.

H.R.H. the Duke of York was present at Castle Bromwich at Luncheon on the Opening Day (Feb. 20), when he took the opportunity of inspecting the exhibits. H.R.H. the Duchess of York also inspected the White City Section on the same day.

Institution of Gas Engineers.

Classification, Rating, and Standardization of Meters.

We are interested to hear that the Meters Committee of the Institution of Gas Engineers has for some time been considering the classification, rating, and standardization of gas meters, and that it is consulting the meter makers on the subject.

Until the Life of Gas Meters Joint Committee of the Institution of Gas Engineers and the Society of British Gas Industries instituted the Standard meter in 1922, the design and construction of the dry meter (apart from the addition to it of many forms of prepayment mechanism) had remained practically unchanged for very many years.

The Standard meter was designed to give a greater capacity than the old "lights" type meter in the same size of case. This principle was further exploited in the production of the high-capacity meter, to meet the greater consumption of gas brought about by the increased use of gas fires, hot water apparatus, &c.

In view of the restriction of space in modern dwellings and the small accommodation provided for gas meters, many meter makers have for some time been carrying out extensive experiments and discussing the possibility of producing higher capacity meters in still smaller cases.

If the Meters Committee can issue a Specification reducing the multiplicity of types and such Specification was generally adopted, substantial progress will have been made in a matter which is of considerable technical and economic importance to gas undertakings.

Further South-Eastern Gas Developments.

Offer to Maidstone Gas Company Stockholders.

An offer to purchase the entire issued capital stock of the Maidstone Gas Company has been made by South-Eastern Gas Corporation, the £1,000,000 holding concern which was recently formed by Dawnay, Day, & Co. and Edward de Stein & Co. to bring about the alliance of leading gas undertakings in the South of England.

Stockholders of the Maidstone Gas Company are offered for each £100 capital stock *ex* dividend accrued to Dec. 31, 1932,

(1) £200 in cash, *or*
(2) 200 South-Eastern Gas Corporation redeemable 4½% cumulative preference shares of £1 each credited as fully paid; *or*
(3) 100 South-Eastern Gas Corporation redeemable 4½% cumulative preference shares of £1 each credited as fully paid, and 80 South-Eastern Gas Corporation ordinary shares of £1 each credited as fully paid.

The Directors of the Maidstone Gas Company recommend acceptance of one or other of the three alternative options to their stockholders. The offer, which is conditional upon acceptance by holders of not less than 55% nominal value of the capital stock of the Company, remains open until Feb. 25, 1933.

And the Dover Gas Company.

A further development in the activities of South-Eastern Gas Corporation, Ltd., is an offer to shareholders and stockholders of the Dover Gas Company to purchase the whole of that Company's issued capital on the following basis:

For each £100 nominal value shares or stock of the Dover Gas Company (*ex* dividend accrued to Dec. 31, 1932) South-Eastern Gas Corporation offers either:

(1) £175 in cash, *or*
(2) 100 South-Eastern Gas Corporation Redeemable 4½% Cumulative Preference Shares of £1 each, credited as fully paid *plus* 60 South-Eastern Gas Corporation Ordinary Shares of £1 each credited as fully paid.

The offer remains open until Feb. 27. It is conditional upon acceptance by holders of 75% nominal value shares or stock of the Company.

An extraordinary general meeting of the Corporation was held on Monday last at 15, Moorgate, E.C., and a resolution was unanimously adopted increasing the capital of the Company to £1,000,000. This will comprise 500,000 Redeemable Cumulative 4½% Preference shares of £1 each and 500,000 Ordinary shares of £1 each.

High-Pressure Gas Lighting for Hereford.

The Lighting Committee of the Hereford City Council, having analyzed the comparative possibilities of gas and electricity, recommended to a meeting of the Council last week that Commercial Street be lighted by way of suspension lighting from columns with four 1000-c.p. high-pressure gas lamps.

In lieu of the existing low-pressure lamps this would involve a capital cost of £91 9s. 3d., and an annual maintenance and gas supply charge of £53 0s. 4d., as against the existing maintenance and gas charge of £27 2s. 6d. The proposal to improve the lighting of Commercial Street

THE NEWS—*continued.*

was disapproved by the Finance Committee but supported by the Development Committee.

Presenting the report, Dr. Shaw said the Lighting Committee were unanimous in deciding that the improvement should be effected, and petitions had been received in favour of it signed by all the tradespeople in the street. The Committee, he said, were entirely satisfied with the high-pressure gas lamps elsewhere in the city, and he pointed out that the Gas Committee were willing to bear the capital cost out of revenue.

Alderman Steel, referring to the attitude of the Finance Committee, said they were of the opinion that this extremely brilliant lighting was a luxury and not a necessity.

The report and recommendation received approval.

Education for Commerce.

H.R.H. the Prince of Wales has consented to be Patron of the British Association for Commercial Education. The Association, of which Sir Francis Goodenough is Chairman, accomplished its first object by successfully organizing the International Conference on Commercial Education, held in London last July, the closing session of which was addressed by His Royal Highness.

It has for its future object, its Chairman states, the co-ordination and stimulation of efforts on the part of employers, of educationists, and of parents to raise the standard of entrants into commerce; to promote the further education and training of those engaged in commerce; and thereby to advance the interests of British trade at home and abroad.

Wandsworth and District Gas Company.

Report of the Directors for 1932.

There has been an increase in the sale of gas of 0·8%. The Directors announce, with much regret, the death on Jan. 10, 1933, of Mr. Robert Garraway Rice, J.P., F.S.A., the Deputy-Chairman of the Company, who was a Member of the Board of the Mitcham and Wimbledon Company since 1891, and appointed Deputy-Chairman of the Wandsworth, Wimbledon, and Epsom District Gas Company at the time of the amalgamation in 1913.

The number of consumers is increased by 6292 and the number of stoves and other appliances by 14,671.

During the year £125,000 of 5% Preference Stock and £150,000 of 5% Debenture Stock were issued.

After providing for Debenture and other Interest charges and payment for the half-year ended June 30, 1932, of a dividend of £2 10s.% on the 5% Preference Stock and £3 10s.% on the Consolidated Stock, there remains a balance of £115,503 15s. 7d., from which the Directors recommend payment of dividends at the same rates, less income-tax, making total dividends for the year of £5% on the Preference Stock and £7% on the Consolidated Stock, which permits the allocation of the sum of £26,444 8s. to the Employee Co-Partners.

[Meeting, Feb. 28.]

An Interesting Public Lighting Catalogue.

All those who are concerned with public lighting in its many and varied forms will find much of interest and value in the revised edition of their public lighting catalogue recently issued by Messrs. William Sugg & Co., Ltd., of Ranelagh Works, Chapter Street, Westminster, S.W. 1

Attention is particularly directed to a number of new features in this publication: (1) The declaration of a mean lower hemispherical candle-power (expressed M.L.H.C.P.) in connection with the principal lamps and fittings, in addition to the highest candle-power obtainable at the best angle; (2) directional reflection lighting—which has become so prominent in recent days; (3) polar curves of typical lamps, with and without directional reflectors; (4) examples of lamps required to meet the various classifications given in the British Standard Specification for Street Lighting; (5) comparative running costs of gas and electric lighting; (6) the foreword explaining the general principles underlying the use of governors, clock controllers, &c.; (7) directions for regulation of "Rochester" and similar lamps; (8) the new cast-iron base for housing controller in connection with "Windsor" lamps; (9) new type of bracket arm extension, and also swanneck extension for street columns; (10) the abolition of scrolls in connection with the upright "Rochester" lamp; and (11) photographs of modern installations.

Full specifications and illustrations are given of a wide range of Sugg lamps and burners for all classes of public lighting work, while particulars are given of distant control devices and governors, together with various types of mantles and nozzles, all depicted in actual sizes.

The photographs of installations of Sugg lamps in the principal cities of the United Kingdom and also in well-known towns overseas are of particular interest, and, showing as they do installations in towns as widely separated as London and Pernambuco, Belfast and Singapore, Glasgow and Ceylon, bear testimony, if such is needed, of the universal confidence placed in the firm's gas lamps for street lighting.

Birmingham Gasfitters' Association.

The President (Mr. Leonard Proctor) was in the chair on Thursday last at the annual dinner of the Birmingham and District Master Gasfitters' Association at the White Horse Hotel. Mr. G. M. Lewis, Controller of Gas Sales, and Mr. R. G. Marsh, Chief Fittings Superintendent, of the Birmingham Gas Department, attended.

Reference was made to the happy and pleasant relationship existing between the Department and members of the Association. The Department relied upon the members to assist in demonstrating the many uses of gas and gas appliances. Co-operation was of the greatest importance and to the advantage of both the Department and the members.

Midland Association.

On Monday of last week the Midland Association of Gas Engineers and Managers held their annual dinner and dance at the Grand Hotel, Birmingham. It was the sixth of such functions, and, like its predecessors, a very great success. The President, Mr. E. B. Tomlinson, Engineer-in-Chief of the Birmingham Corporation Gas Department, was in the Chair. He and Mrs. Tomlinson, who carried a beautiful bouquet of pink carnations presented by the Association, welcomed the company, numbering about 125.

The after-dinner speeches admirably became the occasion. Mr. T. H. Poulson, of Stafford, Vice-President of the Association, briefly proposed the very good health of the President and Mrs. Tomlinson. It was responded to with musical honours. Mr. Tomlinson, in his reply, paid tribute to those who were largely responsible for the successful evening—the Hon. Secretary, Mr. S. G. Sadler, and Mr. R. G. Meiklejohn, who again acted as M.C. The "Dale Forty Symphonics" played selections during dinner and excellent dance music afterwards; and Messrs. Mason and Armes provided several comic interludes at the piano. "Carriages at midnight" was too early an injunction for most of the guests.

Trade Marks Committee, 1933.

The Trade Marks Committee, under the chairmanship of the Rt. Hon. Viscount Goschen, have begun their investigations; and persons and associations who wish to submit suggestions or to give evidence before the Committee are invited to communicate with the Secretary, Mr. R. W. Luce, Industrial Property Department, Board of Trade, 25, Southampton Buildings, W.C. 2.

The Committee were appointed by the Board of Trade to report whether any, and if so what, changes in the existing law and practice relating to Trade Marks are desirable.

Electrolux win International Trophy.

A remarkable British trading achievement was celebrated by Electrolux, Ltd., at a dinner at the Park Lane Hotel last Thursday evening, when it was announced that of the forty-three associated companies, the British Organization had won the International Trophy for the highest quota of sales in 1932.

In a message of congratulation read by the Chairman of the Company, Sir Harold Wernher, Sir Robert Horne, M.P., who opened the Luton factory in 1927, said: "At that time its chief interest to me was the possibility of employment which it might afford to British workmen, and with that consideration in view, gave it my warmest blessing. It is a great gratification to me to know that you are now employing three thousand people in England and spending three-quarters of a million a year in this country on all the things that are involved in operating such a concern.

"I was much impressed with the lay-out of your establishment and am not surprised to hear that you have been able to achieve so great an efficiency in your production. I congratulate you on what you have accomplished and wish you every success in the future."

The "K.D." Air Desiccator.

The "K.D." air desiccator, manufactured by Messrs. Elmesan (London), Ltd., of 66, Victoria Street, S.W. 1, has a multitude of applications, many of which occur in the Gas Industry.

"K.D." replaces calcium chloride in desiccators; keeps deliquescent chemicals dry; contains its own indicator of saturation; keeps balances dry; dries electrostatic apparatus, electrometers, hydrogen-ion, apparatus; and protects all metallic instruments from rust. It has, in addition, a large number of domestic applications, particularly associated with the preservation of foodstuffs, and the removal of moisture from cupboards, wireless sets, pianos, clocks, &c. The working of the "K.D." desiccator is quite simple.

The standard size "K.D." drier is suitable for 10 c.ft. cupboard or space. The perforated container is fitted with a small glass through which the crystals can be seen, some of which are coloured blue and remain so all the time the drier is absorbing moisture from the air. When the crystals become charged with moisture and will absorb no further water from the air, they turn a pinkish colour. They should then be heated in an oven for about 1½ hours until they have resumed their original dark blue colour, after which the apparatus is ready to be placed in the receptacle requiring the drier. If the desiccator is left about in a room it at once absorbs moisture and should be put into an oven to bring the crystals back to their original dark blue colour before using it again.

It does not matter how many times the desiccator is put in the oven to renew its colour; heat cannot damage the crystals. The only thing to avoid is putting the box into water. If this is done the crystals will absorb the water at such a rapid rate that they will burst into powder.

The makers inform us that, although it is but a few weeks since they introduced the "K.D." air drier, they have supplied hundreds to gas undertakings for balance cases.

An Outrageous Proposal.*

Imagine that this country had never had a smoke nuisance because nothing but smokeless methods of heating had ever been used. This nation of clean white towns which sparkle in the bright sunshine is one day amazed to hear of a strange proposal. Here is a leading article from one of the imaginary newspapers of that idyllic land:

Coal, the naturally-occurring chemical base from which so much wealth and power is obtained by distillation and hydrogenation, is the subject of a fantastic project by a group of people who do not seem to have realized the dangerous implications of their ill-advised proposals. It has for long been known, more as a scientific curiosity than anything else, that coal will burn under certain conditions, much as a fuel will; and the scheme, in brief, is that it should be sold to householders for burning in special containers or grates in the house for warming and heating purposes. In the interests of the nation we do not hesitate to say that this is the most deplorable conception that has ever been advanced in modern times, and which from every point of view must be unequivocally condemned.

It is indeed inconceivable that such a crude and barbaric use of this valuable raw material of the chemical industry would in any circumstances be permitted. One would as soon expect public sanction for using the books in the British Museum as fuel, even though they would probably burn quite as well as, if not more easily than, this coal. Again, we understand that coal, if used in the wanton fashion that is suggested, would not be wholly consumed, but would require a chimney or flue to enable the gases and unburned particles to be carried to the outside air. The smoke emitted by coal when burned is, we are informed, both excessive in quantity and highly objectionable in character. It is easy to contemplate the consequences of a general use of the material in any town; there would be such an outpouring of smoke and harmful gases, such a Stygian gloom, such a rain of acids and dirt, that the catastrophic affair would, by urgent mutual consent, be halted almost as soon as it had begun.

Happily there are very strong personal reasons, in addition to those of national concern, which most assuredly will bring about the failure of the project. We have made some inquiries about the conditions under which this coal would have to be used, which, we find, are so preposterous that we cannot imagine any rational person even giving the method a trial. To begin with, coal cannot be delivered along a pipe or a wire, but has to be purchased in bulk, either in large bags or even by the ton! It would therefore require cellars reserving for its storage, or where there are no cellars, special outbuildings would have to be constructed to hold it. From its nature much would crumble into dust, and some would be in such large and awkward pieces that it would have to be broken by hammering; a most primitive and stupid labour.

Then it would have to be brought into the rooms in buckets, and placed, by hand, in the grate. This would not have to be done just once, but continually, as the coal burned away. Nor will it, we understand, light instantly, but requires other substances to assist it. The promoters of the scheme amusingly suggest that it should be lit with sticks of wood, and that these, in their turn, would require to be lit by paper! Further, coal soils the hands, and anything else it touches, and also, as the mineral ash it contains cannot be burned, the grate has to be emptied and cleaned each day before the next fire can be prepared. In addition to the smoke passing out through the chimney, some of it will float out into the room, necessitating frequent cleaning and dusting, and much will lodge in, and tend to choke, the chimney passage. This is frankly admitted by the promoters of the scheme who are hoping—so optimistically—to popularize the method, and they point out that corps of men will be specially trained to clean or decarbonize the chimneys. One can imagine them at work among the bright fabrics and light furnishings of our homes!

The scheme, it will be agreed, would be merely absurd if what chance of success it might have were not so dangerous. We have authority for saying, however, that if it were to assume serious dimensions the Government, which is carefully watching the situation, would step in to take swift and prohibitive action. But we can depend upon the idea failing even before it has begun, simply because to the British housewife it will seem stupid and incredibly dirty. It is not exaggeration to say that when the implications of the use of coal are explained to her, her innate sense of cleanliness and household pride will cause her to recoil in horror from the outrageous proposal.

* From the "Journal of the National Smoke Abatement Society."

Scottish Junior Gas Association.

(Eastern District.)

Visit to Auchengeich Coke Ovens.

By kind permission of Messrs. James Nimmo & Co., Ltd., the Association availed themselves of the opportunity to inspect the coke ovens and bye-products plants at Auchengeich on Feb. 4. The party were met at the works and conducted over the plant by Mr. James K. Dickie, Works Superintendent, and his staff.

In Scotland, coke oven gas has been taken for public service since the year 1925. The supply is obtained from two batteries of coke ovens erected at the Auchengeich Colliery, situated about six miles to the east of the City of Glasgow. The gas is sold on contract arranged with the Glasgow Corporation Gas Department, and is supplied purified, the volume and calorific value also being guaranteed. This being the case, the 18-in. gas main laid by the purchasing undertaking from the Provan Gas-Works to the coke oven plant serves as a feeder to the outlying eastern area of the Glasgow Corporation supply. The gas that is not consumed in the district is sent forward to the Provan Gas-Works holders, and is delivered with their own gas to other districts of the city. The main supplies directly Chryston, Muirhead, Gartcosh, Stepps, and Millerston. The total population of the combined districts is about 16,000. The area through which the main passes is developing rapidly, and, with the extension of housing schemes and industrial activity on the eastern boundary of Glasgow, there is reason to believe that the total number of gas consumers will increase still further.

The calorific value of the gas as specified is 480 B.Th.U.

The volume of gas delivered initially was approximately 1¼ million c.ft. per day, and this quantity was increased by an extension of the works in 1928 to over 2 million c.ft. per day.

The carbonizing plant at Auchengeich Colliery consists of 28 Willputte regenerator ovens capable of dealing with a daily throughput of 400 tons of coal. The working operation of the plant was thoroughly explained and demonstrated. Much interest was shown in the sulphate of ammonia plant, where the direct recovery of ammonia from the gas is practised. The bye-products plant is further augmented by a benzole recovery plant producing 900 gallons of crude benzole per day.

On the conclusion of the visit the members were entertained at tea on the works, and Mr. D. Warden, President, returned the thanks of the Association to Mr. Dickie and his staff for the instructive afternoon they had provided, and to Messrs. James Nimmo & Co., Ltd., for their hospitality and permission to visit the works.

THE NEWS—continued.

Institution of Chemical Engineers

Annual Meeting.

The Eleventh Annual Corporate Meeting of the Institution of Chemical Engineers was held at the Hotel Victoria, London, on Friday, Feb. 17, and was followed by the annual dinner in the evening. Lord LEVERHULME (the President) was in the Chair.

The PRESIDENT, in presenting the annual report of the Council and the accounts at the morning Session, spoke of the satisfactory manner in which the membership had been maintained and, indeed, slightly increased during the past year, and, in a personal capacity, mentioned the great loss which had been sustained in the death of Sir Arthur Duckham.

The HON. SECRETARY (Mr. H. W. Cremer), in a general review of the work of the Institution during the past year, said that from the membership point of view it was very pleasing to notice the number of requests for information concerning the Institution and the necessary qualifications for membership. There was ample evidence that the Institution now represented a very living force in the industrial, educational, and, he might say, the social life of the country, quite apart from the ties which it had formed with the Dominions through its members resident overseas and with the corresponding body in the United States.

Mr. F. A. GREENE (Hon. Treasurer) presented the accounts, and the report and accounts were then adopted.

It was then announced that the following had been elected to the Council for the coming year:

President.—Viscount Leverhulme.
Vice-Presidents.—Dr. H. Levinstein, Mr. H. Talbot.
Hon. Secretary.—Mr. H. W. Cremer.
Hon. Treasurer.—Mr. F. A. Greene.
Members of Council.—Mr. E. Briggs, Mr. H. J. Pooley, Dr. F. S. Sinnatt.
Associate Members of Council.—Mr. C. C. H. Brazier, Mr. H. A. S. Gothard.

Lord LEVERHULME delivered his Presidential Address. In this he briefly traced the history and development of the soap industry, illustrating his remarks with a number of lantern slides of ancient and modern methods.

At the afternoon Session, a paper entitled "Metallurgy from the Standpoint of the Chemical Engineer" was read by L. SINGLEHURST-WARD.

The Dinner.

The Annual Dinner took place in the evening at the Hotel Victoria, the Rt. Hon. Viscount Leverhulme presiding over a company of more than 200 members, ladies, and guests. Among those present were Mr. J. F. Ronca (Gas Administrator at the Board of Trade) and Mr. R. E. Gibson (President of the Institution of Gas Engineers).

Proposing "The Institution of Chemical Engineers," Sir FREDERICK GOWLAND HOPKINS (President of the Royal Society) said it needed the repercussion of the Great War to bring chemical engineering and its great activities into being. When the late Lord Moulton was Chairman of the Medical Council in the early days he had said, only a short time before the war and little knowing what was before us, that there were two people who needed encouragement in this country—viz., the bio-chemist and the chemical engineer. That was typical of the late Lord Moulton's great wisdom, and the Institution of Chemical Engineers, once formed, had been very faithful to the ideals of its founders, more especially with regard to its policy of technical education and also in regard to research. From the point of view of the technical education of the younger members of the profession, the Institution was in the forefront of professional associations, while in respect of research it was to be congratulated on the wonderful researches it had encouraged.

The PRESIDENT, responding to the toast, said the toast of the Institution on the present occasion was of special significance because the proposer of it was not only President of the Royal Society but also President of the British Association for the Advancement of Science, and for that reason the link between pure and applied science was not a missing one. Lord Leverhulme recounted that one of the sales directors of one of our largest industrial concerns in a recent speech had given an admirable definition of the difference between a salesman and a technician. A salesman was defined as a man who knows a very little about a great deal, and keeps knowing less and less about more and more, until he finally knows nothing about everything. A technician, on the other hand, was defined as a man who knows a great deal about very little, and he goes on knowing more and more about less and less until he finally knows practically everything about nothing! Could there, he added, be two components more capable than the salesman and the technician to enter into complete combination in the presence of that very necessary catalyst the confiding shareholder?

Dr. HERBERT LEVINSTEIN, who proposed "Our Guests," referred to the educational work of the Institution, and said that specialized education such as the training of the chemical engineer required a perfectly solid secondary education system and a very long preparation for the specialized work to be done later.

Dr. A. C. SEWARD, F.R.S. (Master of Downing College, Cambridge), made the first reply to the toast, and was followed by Prof. H. E. ARMSTRONG, F.R.S.

Dr. R. H. PICKARD, F.R.S. (President, Society of Chemical Industry), replied on behalf of the kindred Societies whose representatives had been so hospitably entertained. Referring to industrial research, he said he was pleased to see the broad outlook adopted by the Institution in seeing that co-operative research did not include only one industry. So many industries were inter-related that a broader outlook must be adopted. There had been the danger of industrial research getting into water-tight compartments, and that must be avoided.

The final toast of "The President" was proposed by Mr. W. A. S. CALDER, and was briefly responded to by Lord LEVERHULME, who again acknowledged the great assistance he had had from the members of the Council, the Hon. Secretary, and the Assistant Secretary and staff.

CONTINENTAL NOTES

NOVEL TYPE OF INTERMITTENT CHAMBER OVEN.

M. Permien, in "Das Gas- und Wasserfach," 1933, 76, 46-47 (Jan. 21), describes a new type of vertical chamber oven erected at Rostock Gas-Works by the Didierwerke.

The special feature of the ovens is that each is divided into two neighbouring compartments by a vertical wall extending from the bottom to within a short distance of the top. The larger portion, which has a major axis 5 ft. 7½ in. long, forms a coal chamber, and the smaller portion (2 ft. 2 in. long) forms a coke chamber.

The coke chamber is filled nearly to the top with small coke 0·4-0·8 in. in size. After the coke has become red-hot (2-4 hours, depending on the temperature) the coal chamber is filled. The carbonization products from the coal pass through the hot space over the coke charge and thence to the collecting main. Throughout the operating period, the coke charge is steamed. The space above the coke is heated independently and controllably, and in it the coal gas and the water gas from the coke meet. The water gas becomes partially carburetted as a result of cracking of the tar and absorption of the light oils contained in the tar. The calorific value of the water gas is therefore very high, and it is thus possible to obtain an enhanced yield of gaseous therms at the declared calorific value. The coal charge is steamed during the last two hours of the operating period, after which the coal chamber is discharged in the normal manner and refilled. The contents of the coke chamber are replenished to make good the coke which has been converted into water gas.

When gas at a calorific value of 465 B.Th.U. per c.ft. is made, the therm yield per ton of coal is said to be 25% greater than it is in the usual type of intermittent chamber, and a coke of good quality is obtained.

The plant is flexible in that, if occasion demands, the coke chamber as well as the coal chamber can be charged with coal, and, in addition, a mixture of coal gas and producer gas or coal gas alone can be used instead of producer gas for underfiring.

The setting, which consists of six chambers holding 1·68 tons of coal per charge, has been successfully at work since March, 1932.

From Bismarck coal in the form of nuts 0·4 by 0·7 in. and showing moisture 5·3%, volatile matter (less moisture) 31·6%, fixed carbon 58·8%, ash 4·3%, the make of 466 B.Th.U. gas was 20,910 c.ft. per ton of coal charged, equivalent to 97·4 therms. The operating period was 12 hours, and temperatures were 1210°-1350° C. at the top and 1240°-1350° C. at the bottom. The fuel consumption was 16·55 lbs. of dry ash-free coke per 100 lbs. of coal, and the steam admitted 14·33% of the weight of the coal. Of the steam, approximately 12% was used in the coal chamber and the remaining 88% in the coke chamber.

New Coking and Bye-Product : Installation at Pont Brûlé : Confirmatory Test

In our issue for Aug. 10, 1932, we published a detailed description of the battery of 54 Collin patent compound regenerative ovens, 39 ft. 4½ in. between doors, 14 ft. 9 in. high, with an average width of 16½ in., with complete bye-product plant, including benzole rectification as well as coal and coke handling equipment, built by Gas Chambers and Coke Ovens, Ltd., London, for the Imperial Continental Gas Association (acting on behalf of their subsidiary, Les Cokeries du Brabant). In that description, reprinted from the "Iron and Coal Trades Review" for July 22, 1932, were tabulated the operating and official test results.

The "Iron and Coal Trades Review," Nov. 11, 1932, gave additional information of the plant, as follows:

The plant has now been in very successful operation for upwards of a year and has given consistently good results. It is interesting, however, to consider the results of the confirmatory test provided by the contract, which has just been completed. After being in operation for the period specified under everyday working conditions, any constructional or other defects would certainly have revealed themselves, and these defects would have been made evident by such confirmatory test. It is equally evident that the figures obtained after twelve months' working are such as may reasonably be expected to be maintained over a very long period and must, therefore, be regarded as still more convincing than the initial figures.

The results obtained are as follows:

Confirmatory Test—Pont Brûlé Coke Oven Plant.

—	Guarantees.	Original Tests.	Confirmatory Test.
Daily throughput corrected to basic coal, tons per day	..	1200 to 1300	1282
Flue temperature, °C.	1300	1287 ,, 1319	1313
Gas temperature in space above coke, 1 hour before pushing, °C.	900	775 ,, 789	710
Fuel consumption, corrected to coal containing 6% moisture, therms per ton	19·5	18·5 ,, 19·5	18·76

The coal used was a mixture of different washed slacks containing about 10% moisture, and the fuel gas used was a mixture of debenzolized coke-oven gas and producer gas, having a gross calorific value of about 480 B.Th.U. per c.ft.

The fuel-consumption figure of 18·76 therms per ton on the basis of 6% moisture in the coal, or, expressed in another way, 838 B.Th.U. per lb., can be regarded as being among the most favourable figures so far obtained. In default of any more apparent reason, one is forced to the conclusion that the ease with which low fuel-consumption figures are obtained with the Collin oven depends on the unique method of firing. By virtue of the upward and downward combustion which alternates in all the heating flues, the walls have a minimum of dead space—*i.e.*, unheated areas—at any period. It is claimed that in the Collin oven avoidance of the use of combustion flues merely as offtakes for products of combustion prevents fluctuations in wall temperature, and allows coking to proceed uniformly, in accordance with a permanently-established temperature gradient from heating flame to oven charge.

In the Collin oven the products of combustion are taken away at comparatively high velocity through narrow ducts in the pillars separating combustion flues. The latter statement, of course, applies to the upward combustion periods, the ducts being employed during downward combustion for the flow of heated air (and low-grade gas when in use) from the regenerators, also at high velocity, to the upper combustion nozzles. In practice the walls of Collin ovens are found to be very evenly heated at all times, and it may be concluded that the soaking of heat into the dividing pillars from the adjoining combustion flues which are at all times flame-heated, in additon to the velocity effect suggested above, successfully overcomes any tendency towards the formation of cooler strips of wall.

Final reference may be made to the fact that the Pont Brûlé installation incorporates the new feature of individual "box" regenerators. Thus, instead of the usual two transverse regenerators under each oven, each equal to half the length of the oven, there are as many regenerators as heating flues. The ovens being designed on the compound principle, four of these regenerators are called into action in connection with each heating flue—two taking hot products of combustion while two are imparting heat, one to the air and one to the gas when low-grade gas is used, and both to the air when high-grade gas is employed. It may be added that the "box" type construction of the regenerators incorporates stout pillar walls separating the regenerators transversely, and gas-tight walls longitudinally, such construction being both strong and leak-free.

BOOK REVIEW

THE 1933 EDITION OF "SPECIFICATION."

Reviewed by "CRITIC."

For members of the Gas Industry, and particularly those employed on the selling side who are anxious to keep in touch with modern building construction practice, there is as usual a fund of useful information in the 1933 edition of "Specification" (The Architectural Press, 9, Queen Anne's Gate, London), which is now on sale, price 10s. 6d. In the new edition there is a section dealing with modern bakeries, and, although illustrations of gas-fired ovens appear, the generally accepted superiority of town gas in the modern bakery is not properly recognized. In a measure this may be due to the Gas Industry having failed to capitalize the widespread application of town gas as the modern medium for baking the nation's "staff of life."

Under the heading "Heating and Ventilating Engineer" it is notable that in the sub. paragraph "Thermal Storage System," which deals with large-scale "off-peak" water heating, only electric heating is discussed; if there is any future for this system of water heating it is to be hoped that the Gas Industry is—or soon will be—in a position to compete.

An interesting section is that devoted to "Gas Coke for Central Heating," wherein a description of thermostatically controlled coke boilers is well set out and diagrammatically illustrated. A table should prove most useful in connection with the selection of boilers of a suitable size. If one is inclined to judge the comparative importance of gas coke and oil as heating agents by the reading matter devoted to the use of those competitive fuels respectively, then the scales are in favour of oil, the number of pages dealing with oil being 4 to 1 dealing with gas coke.

The section "Lighting Engineer" is treated in a most impartial manner, and modern methods of gas lighting receive due attention. It is interesting to compare the nature of the "Electrical Engineer" section with that of the "Gas Engineer" section, keeping in mind that the Gas Industry greatly overshadows the Electrical Industry in respect of heat units sold. The electrical section opens with "Definitions of Standards of Electrical Units of Measurement." No mention is made of Standards of Gas Measurement in the "Gas Engineer" section, and one may therefore be pardoned for raising one's eyebrows to the powers that be in the Gas Industry who are really responsible for neglecting this fundamental necessity. The Architect looks to "Specification" for authoritative information on subjects of this nature, and the Gas Industry must be blamed for the omission of "Definitions of Standards of Thermal Gas Units of Measurement."

The excellent advertisements of the Gas Light and Coke Company and the British Commercial Gas Association certainly enhance the prestige of the Gas Industry.

Taken as a whole, the 1933 edition of "Specification" surpasses previous editions in comprehensiveness, and will prove an asset to the gas engineer's library.

THE "JOURNAL" TECHNICAL RECORD

Which contains Reports of Meetings of Gas and Allied Associations

Notes on Distribution*

By P. RICHBELL, Croydon Gas Company

It was a common saying years ago that the profits of a gas undertaking were made in the retort house. I feel sure everyone will now agree that this honour must be shared with the Sales Department of the undertaking. To maintain this position the Sales Department, apart from the efficiency of its own organization, must be supported by a well-organized Distribution Department which must be capable of maintaining a continuous supply of gas at an adequate pressure throughout the district at all times.

The Distribution Department of an undertaking is primarily a spending department, and in these circumstances those responsible for running it should arrange for the work to be carried out as economically as possible, compatible with the maximum efficiency of the department.

In the following notes I have given a brief description of the practice and appliances which are used in my Undertaking, in an endeavour to obtain this objective.

MATERIALS.

Cast-iron pipes are used practically exclusively for low-pressure mains, and all vertically cast pipes are in accordance with the British Standard Specification Class "A." During the last seven years, we have used spun pipes in all sizes up to 14-in. diameter. When we first tested Stanton spun pipes there was a slight difficulty owing to brittleness, and this was found to be due to inadequate annealing. This difficulty was soon overcome and the pipes have since proved quite satisfactory.

We have recently used a quantity of Staveley spun pipes, and these have also proved quite satisfactory. As you are no doubt aware, no annealing process is necessary in the manufacture of the Staveley spun pipe. We have always used Class "B" in this type of pipe, but I understand some undertakings have considered using Class "C" or "D" in order to obtain the advantage of additional strength of the pipe. We have experienced no difficulty with 100 miles of these pipes which have been laid during the last seven years, and I do not feel there is any justification for incurring the additional expense of purchasing the heavier classes of pipes. To my mind, if adequate attention is paid to the bed on which the pipes are laid no difficulty will be experienced with Class "B" pipes.

The Staveley spun pipes are only supplied in 16-ft. lengths, and to enable us to use these pipes in slightly curved roads we have now added 1/64th bends to our list of standard specials, one of which is used occasionally to correct the line of main and prevent joints being cramped.

Arrangements are made for a pipe inspector to examine during manufacture and test all pipes and specials to my Company's orders before they are despatched from the foundry.

Steel tubes are used for all high-pressure mains, and where it is necessary to lay low-pressure mains very shallow. They are also used for bridges and under railway crossings. Weldless steel tubes can now be obtained up to 16-in. diameter and lapwelded tubes up to 72-in. diameter. The lengths of tubes vary from 18 to 45 ft. All tubes used by my Company are double wrapped with hessian cloth, and sufficient hessian cloth and bitumen are supplied by tube manufacturers to wrap all joints after testing. The joint is warmed before applying hessian, which is immersed in hot bitumen, to ensure proper adhesion to the tube. The tubes are also coated internally with linseed oil to prevent internal corrosion of pipes while in stock.

Leaded yarn, consisting of a specially woven section of spun yarn sheathed in a thin coating of lead, is used in place of ordinary spun yarn, in conjunction with a special joint which will be described in these notes under the heading of "Joints."

Lead Wool.—Various samples of this class of material have been tried, and lead wool was generally adopted about twelve months ago, and is now used for all sizes of joints up to 12-in. diameter in conjunction with leaded yarn as mentioned above.

TOOLS.

Trench digging machines considerably reduce the cost of mainlaying, but, unfortunately, they can very rarely be used owing to the large amount of plant belonging to other public utility undertakings which exists in the roadways in these days. I hired one of the bucket type of excavators about two years ago when laying a mile and a half of 12-in. and 8-in. mains across a new estate, and in this case the labour costs for laying these sizes of main were approximately halved. The sub-soil was ideal for this type of machine. We tried to use the same machine in a clay sub-soil and had to abandon the idea, as the clay would not clear itself from the buckets.

We use pneumatic road breakers for breaking up all kinds of surface, from tar macadam to reinforced concrete, and in cases where the sub-soil consists of hard chalk or gravel a second layer is loosened with these machines. About fifteen months ago it was decided to purchase an additional set, and after inspecting and having trial runs with various types of plant a Diesel oil engine driven set was purchased. This set has proved quite satisfactory and very economical in running costs. The initial cost was slightly more than for a petrol-driven set of similar capacity, but the economy in running costs has more than paid for the additional cost of the plant. The conditions under which these machines work vary from day to day, but it is estimated that the running cost of this plant is approximately 25% of a petrol-driven set.

A thrust boring machine manufactured by the Hydraulic Engineering Company has proved invaluable when laying mains and services from 1 in. to 8 in. in diameter under concrete roadways and railway crossings. This machine was first used to lay an 8-in. steel tube under a double railway track, and it is estimated that, on this one job, 33⅓% of the cost of the machine was saved. The boring was commenced at 9 a.m., and the tube was placed in position by 3 p.m the following day. The use of this type of machine avoided the necessity of arranging with the Railway Company to place supporting timbers under the track. There is, also, a considerable saving in time, as the supporting timbers can usually only be placed in position at the week-end, during the early hours of the day.

Explosion power rammers are used in all cases when filling-in trenches in made-up roads. These machines consolidate the trenches much better than hand punning, and in consequence considerably reduce the amount of surplus material which has to be removed from site. Another important factor is that the use of these machines has reduced the possibility of settlement of trenches when they have been taken over by the Local Authority. This, as you will appreciate, assists in maintaining the good relationship which should always exist with the officials of the Local Council.

Pipe locating machines are always used to trace the position of pipes of which there is no record in the office before making any openings. This type of machine saves a considerable sum annually in wages for opening trenches to trace the position of mains and services, quite apart from the cost of permanent reinstatement of trenches.

A "box finder" is useful in tracing positions of syphons and valve boxes which have been covered with a thin layer of material. This very often occurs after a road has been tar sprayed, and by using this machine any disturbance of road surface is avoided. One of these machines is always carried by the syphon pumper.

* From a paper before the London and Southern District Junior Gas Association, Feb. 17, 1933.

Joints for Cast-Iron Pipes.

Until a few months ago, the run lead joint was used for cast-iron pipes. The depth of lead used for various sizes of pipes is as follows:

4-inch main	1¾ in.	14-inch main	2½ in.
5- ,,	1¾ ,,	16- ,,	2⅝ ,,
6- ,,	2 ,,	18- ,,	2½ ,,
8- ,,	2 ,,	20- ,,	2⅝ ,,
10- ,,	2¼ ,,	24- ,,	2⅝ ,,
12- ,,	2¼ ,,		

This type of joint is still used when making joints on old pipes up to 12-in. diameter, as the joints vary considerably in size. With regard to new pipes up to 12-in. diameter, we have now adopted the joint as shown in fig. 1. This consists of a ring of leaded yarn, rubber ring,

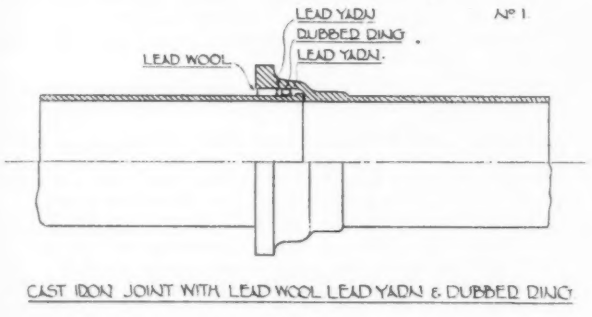


Fig. 1.

another ring of leaded yarn, and the remainder of the joint is filled with lead wool. Experiments have been carried out in Croydon, in conjunction with the Rubber Research Association, with regard to the best type of rubber ring for this purpose, and it is hoped to evolve a definite specification at an early date. The cost of this joint is slightly more than the ordinary lead joint, but it is hoped to reduce the possibility of leakage due to vibration from passing traffic. It is difficult to realize what the traffic conditions will be in the future, but it is felt that any improvement which can be made in the type of joint used to-day should be taken advantage of to the greatest extent, as it will delay the time when it will be necessary to examine these joints. The material used for surfacing roads is also becoming more expensive, and considerable expenditure may be saved in the reinstatement of trenches. When laying mains above 12-in. diameter it is felt that the joints can only be made satisfactorily by using pneumatic caulking hammers. We laid approximately one and a half miles of 18-in. and 24-in. main in 1930, the joints being made as described above, except that spun yarn was used in place of lead yarn. The joints were caulked with pneumatic tools and proved very satisfactory. Samples of other types of joints for cast-iron pipes have been submitted for test, but no actual lengths of main have been laid.

I feel sure the half-turned and bored joint with lead wool in front of joint is ideal, but unfortunately, owing to rigidity of joints, it can only be used in straight roads. The general tendency to-day when new estates are laid out is to avoid as far as possible straight roads, which considerably reduces the use of this type of joint. If this type of joint is used it is advisable to lay a "converter" pipe with ordinary type of lead socket every 50 yards, to act as an expansion joint.

Joints for Steel Tubes.

When laying 4 in. by 6 in. diameter mains butt welded joints are used, but for larger sizes the long sleeve welded type of joint is used. The butt welded joint is quite satisfactory in the smaller sizes of tubes which can be easily pulled into position while the welder makes the joint, but in the larger sizes this is more difficult, particularly in curved roads. The slight increase in cost of this type of joint is met by the saving in time while actually making the joint. Particular attention should be paid to the radius of the lip at the mouth of the socket to ensure that a good body of metal can flow into it during the welding of the joint.

There is little to be said in regard to mainlaying practice. The minimum size of main laid to-day is 4 in. in diameter. All specials are strictly to British Standard Specification, with the exception of reducers, which are flat bottomed as shown in fig. 2. They are cast in this form to prevent any accumulation of liquor in the main when it is being laid with a fall towards the small end of the reducer.

Split tees are used for inserting branches in live mains over 12-in. diameter.

When it is necessary to rider a main or make a temporary connection to a service, flexible copper tubes of suitable sizes fitted with unions at each end are screwed into tappings in the main, the intervening space between the ends of the flexible tubes being made up with suitable length of barrel. This method saves a considerable amount of time when fixing riders.

Bladders are used for "bagging off" mains up to 4-in. diameter, and bags for larger sizes. Double bagging is always used for all sizes above 6-in. diameter. When bagging off spun pipes a size larger bag is used, owing to the internal bore of the pipe being slightly larger than the nominal. The ends of all mains abandoned are sealed with concrete, and in cases of long lengths the main is broken out at frequent intervals, and after being allowed to aerate for some hours is sealed with concrete.

Stoppers are always pulled through mains whether being laid alive or dead, to ensure that nothing is left in the main.

All old pipes which are being re-laid are brushed out with circular bass brushes, and then well oiled with water gas oil.

Mains are laid at an average depth of 30 in., and where concrete roads are being laid duplicate mains are laid in each footpath. Arrangements have been made with the Engineer and Surveyor of several Local Councils in my Company's area of supply to advise us of all roads which it is proposed to reconstruct during the year and the approximate date on which it is proposed to commence the reconstruction of the road. The local authority is then notified of the roads in which it is proposed to examine our plant and arrangements are made to complete our work a few weeks prior to the date on which the Council proposes to commence reconstruction of the road. In all cases where the existing main is 3-in. diameter or smaller it is replaced with at least a 4-in. main. Where the subsoil is very bad and the services are in a very bad con-

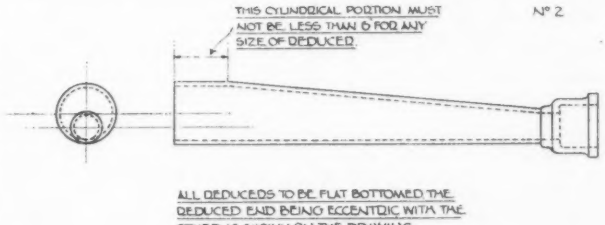

THIS CYLINDRICAL PORTION MUST
NOT BE LESS THAN 6 FOD ANY
SIZE OF REDUCED.
Nº 2
ALL REDUCERS TO BE FLAT BOTTOMED THE
REDUCED END BEING ECCENTRIC WITH THE
OTHER AS SHOWN ON THE DRAWING.
CAST IRON REDUCER

Fig. 2.

dition it is cheaper to lay a duplicate main on the opposite side of the road to the existing main and avoid the cost of re-laying the services. This particularly applies in roads where houses have a small frontage.

Testing Mains.

Cast-iron mains are tested whenever possible at a pressure of 70-in. water column. The type of gauge used is shown in fig. 3. This gauge consists of a "U" tube, one-half of one arm being a glass gauge tube, which is connected to steel portion of "U" tube by means of a suitable stuffing box. The gauge is mounted in a sheet metal case, and has connections for attachment to the main, and, also, to a force pump for charging the main. The duration of tests is usually twelve hours. This method is very sensitive and the slightest leakage is indicated by the gauge.

Steel mains are tested at a pressure of 90 lbs. per sq. in., and all joints are coated with a film of lubricating oil to enable the foreman to detect any pinholes in the joints due to defective welding, which would not be detected by any drop in pressure on the Bourdon gauge. Each section of main is subjected to a test of twelve hours' duration.

Emergency Arrangements for Escapes, &c.

Escapes on premises are dealt with in the first instance by a fitter, and if he finds the escape is entering the premises from outside, he immediately communicates with the Inspector at the District Office. On receipt of his report, the Inspector communicates with the Distribution Department at the Head Office. Arrangements are made for the mains and service foreman of the district to be advised as quickly as possible, and a message sent to the nearest main or service laying gang to proceed to the address given by the Inspector.

In the case of an escape occurring after working hours, if the Inspector finds the escape is entering the premises from the roadway, he telephones the foreman of the Dis-

tribution Department, who communicates with the driver of the mains lorry. This man, who resides at the depôt where the lorry is garaged, immediately loads the lorry with the necessary tools, which are kept in a bin in the garage expressly for this purpose. He then collects the requisite number of men and proceeds direct to the address

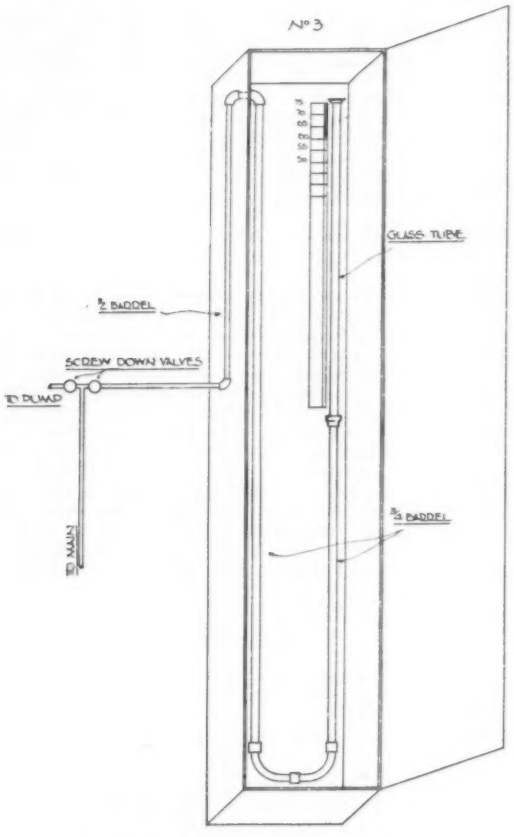


Fig. 3.

given by the foreman. In the meanwhile, the foreman has ascertained from records in the Drawing Office the position, &c., of mains, and proceeded to the site of the escape to await the arrival of the lorry and men.

Service Laying.

Steam quality wrought-iron tubing and fittings to the specification of the Institution of Gas Engineers are used for all services. Generally, 1-in. services are laid for domestic supplies not exceeding 70 ft. in length and 1¼ in. in excess of this length. In cases of very long services, services for industrial purposes and large institutions, the size of the service is specially determined in each case.

All services are connected to the top of the main wherever possible by means of connecting bends.

Valves are fixed in public footpaths on all services of 2 in. and upwards in size.

In cases where a service supplies more than one meter in different parts of a building an enamelled metal caution label is attached to the inlet of each meter. The wording on the label is:

CAUTION.
THIS SERVICE PIPE SUPPLIES
MORE THAN ONE METER.

All lamp services are fitted with a 1 in. by 1 in. by ¾ in. tee, and a short piece at the bottom of the standpipe in place of the usual bend, and any corrosion which takes place in the standpipe drops into the short piece. This arrangement has practically eliminated the necessity of the clearing lamp services due to corrosion at the bend at the bottom of the standpipe.

Bottle syphons are fixed on all services where it is impossible to lay the service with a fall towards the main.

Rubber plugs are used while laying services, to prevent soil getting into the service while it is being laid. These plugs have been found much more satisfactory than using rag or waste, as there is no possibility of the supply being defective when the meter is fixed due to a piece of waste or rag having been left in the service pipe.

All holes for services on cast-iron mains are drilled with the usual type of drilling machine fitted with combined drill and tap. In the case of steel mains, after drilling and tapping main a nipple is expanded into the main by means of mandril provided with drilling tackle.

All services are tested to 18-in. water gauge before connecting same to main.

Protection of Services Against External Corrosion.

Various methods of protecting services against external corrosion have been tried, and after a number of experiments extending over a considerable period the following have been generally adopted:

1. In good class soils all joints are painted with dehydrated tar.
2. In poor soils Schades " Bull Dog " wrapping is used. A number of services which have been wrapped with this material and laid in a very bad sub-soil were found to be in perfect condition after two years.
3. In very bad soils the services are laid in troughing, filled with pitch. A small percentage of sawdust is added to pitch to make it set more quickly. To ensure services being laid in the centre of the troughing the service is supported on galvanized clips which pass under the service and over the side of the troughing at frequent intervals.

District Governors.

Before describing types of district governors in use in a large portion of our area, I propose to give you a brief description of our distribution system. The whole of the gas is manufactured at our works at Waddon. The area to be supplied with gas is approximately 73 square miles, and the maximum distance from the works to the boundary of the district is approximately fifteen miles. We have a number of water-loaded station governors at the works which control pressures to districts in the immediate vicinity of the works. To feed some of the outer districts, booster mains have been laid to crucial points, where governors have been fixed through which the gas is discharged into the low-pressure distribution system. These governors are set at a fixed pressure suitable for the local requirements, and a master governor is fixed at the works on each boosting main. The pressure on the outlets of these governors is varied to suit the demand throughout the day, and at night it is reduced to 45-tenths, and the district governors are thrown out of action. By way of interest, we are at present delivering gas into a small holder situated approximately thirteen miles from the works, with an initial pressure of 25 in.

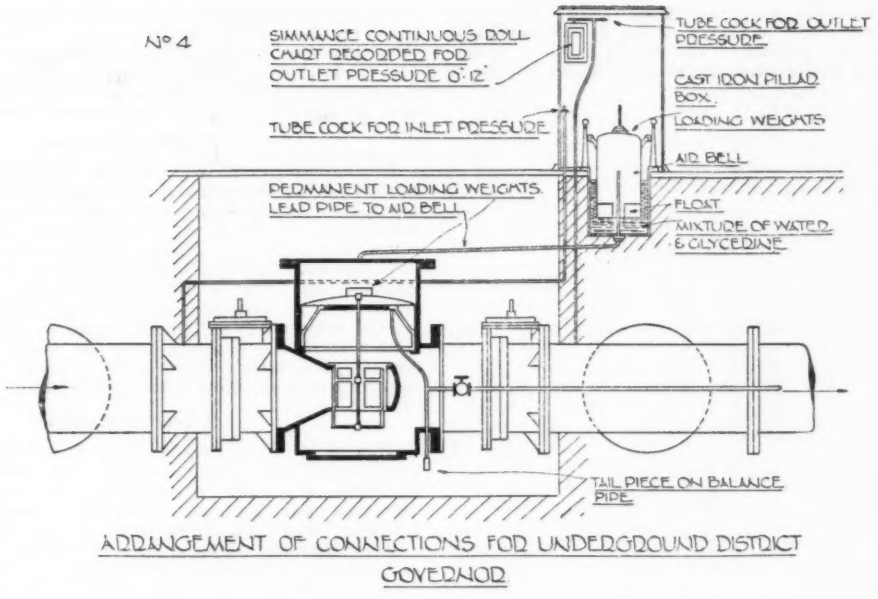
The boosting plant at the works is capable of delivering gas into the district at a maximum pressure of 40 in. water gauge.

The underground type of governor generally used on the district is manufactured by Peebles & Co., Ltd., and the pressure on the outlet of the governors is varied by loading an air bell fixed in a cast-iron pillar-box mounted on the pavement adjacent to the governor. This affords an easy method of varying the outlet pressure of the governor and avoids the necessity of opening the pit in which the governor is situated, with consequent dislocation of traffic.

The connections between the air bell and the governor are shown in fig. 4. The connection between the air bell and the governor is made with heavy lead pipe. The air bell tanks are filled with a mixture of glycerine and water to prevent the possibility of freezing during cold weather.

A permanent weight is placed on the main bell of the governor, which is capable of giving a minimum outlet pressure of 40 tenths. This precaution was adopted to ensure this minimum pressure being maintained on the outlet of the governor in case the pillar-box was damaged by passing traffic and the connection between the air bell and the governor severed. To ensure these governors working correctly it is necessary to connect the balance pipe from underneath the side of the governor bell into the outlet main at a point 5 to 6 ft. from the governor. A tape chart pressure recorder is fitted in the pillar-box, and gives a constant record of pressures maintained on the outlet of governor, and also a pipe is run from the inlet of the governor to the pillar-box so that pressures can be taken when required. All governors are fitted with a suitable by-pass.

The governors are thoroughly overhauled once a year.


Nº 4
SIMMANCE CONTINUOUS ROLL CHART RECORDED FOR OUTLET PRESSURE 0-12"
TUBE COCK FOR INLET PRESSURE
PERMANENT LOADING WEIGHTS LEAD PIPE TO AIR BELL
TUBE COCK FOR OUTLET PRESSURE
CAST IRON PILLAR BOX
LOADING WEIGHTS
AIR BELL
FLOAT
MIXTURE OF WATER & GLYCERINE
TAIL PIECE ON BALANCE PIPE

ARRANGEMENT OF CONNECTIONS FOR UNDERGROUND DISTRICT GOVERNOR

FIG. 4.

The water line in the air bell tank is checked frequently, and tail pieces on pressure pipes are tested occasionally to make sure no condensation has formed.

Last year we installed two station governors supplied by Peebles & Co., Ltd. The arrangement of the connections for these governors is shown in fig. 5.

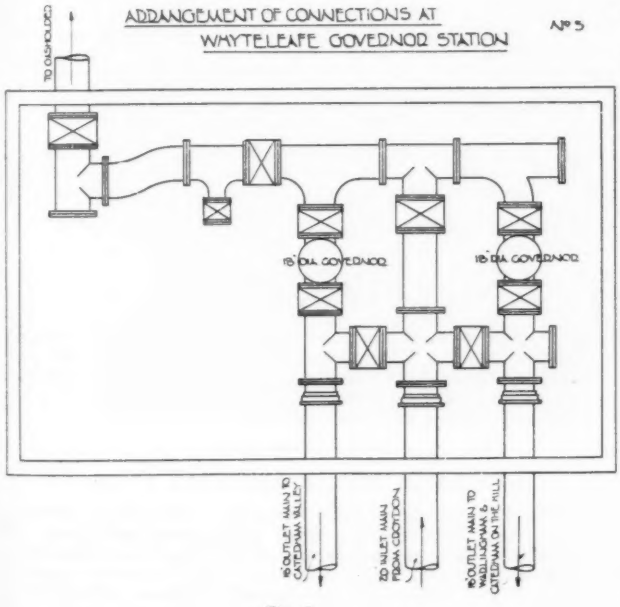

ARRANGEMENT OF CONNECTIONS AT WHYTELEAFE GOVERNOR STATION
Nº 5
TO GASHOLDER
18" DIA. GOVERNOR
18" DIA. GOVERNOR
18" OUTLET MAIN TO CATERHAM VALLEY
18" INLET MAIN FROM CROYDON
18" OUTLET MAIN TO WARLINGHAM & CATERHAM ON THE HILL

Fig. 5.

These governors are loaded by the pressure of gas on the inlet of the governors. A stream of gas from the inlet passes through a direct loaded auxiliary governor mounted on top of the main governor, the outlet of which is connected to a chamber on the top side of the main governor bell. A connection is also taken from this chamber to an ejector, the outlet of which is connected to the outlet main from the governor. The suction in the ejector is created by connecting the inlet pressure to the ejector and then into the outlet main. This ensures a constant stream of gas passing through the auxiliary governor and over the main bell of the governor, the ejector being adjusted to suit the requirements of the rate of flow of the gas. This ensures the removal of any surplus gas due to rise of the main bell as the demand for gas on the district decreases. A diagrammatic sketch of this arrangement is shown in fig. 6. The variations in pressure on the governor are carried out by the application of small weights to the auxiliary governor. A weight about the size of a shilling will vary the outlet pressure by approximately 2 tenths.

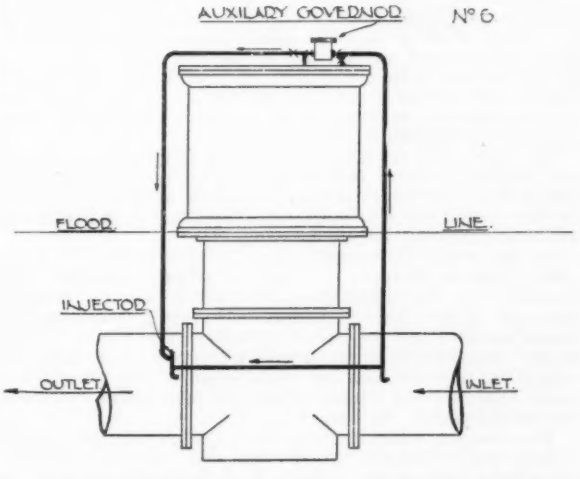
These governors are not affected by inlet pressure and are particularly suitable for the case mentioned above, as they are connected direct to a boosting main

Records of Pressures on the District.

In these days of scientifically and thermostatically controlled apparatus which is being installed on the district it should be the aim of every distribution engineer to maintain adequate and even pressures throughout the day in every part of the district. I propose to give a résumé of the methods used by my Company in an attempt to attain this object.

Pressures on the district are altered throughout the day to meet variations in demand. Two schedules of pressures are in operation, one for six months commencing April 1, and the other for six months commencing Oct. 1. Each schedule is checked before being put into operation, and adjustments are made to correspond with any alterations which have been made in the distribution system since the schedule was last in operation.

To ensure a satisfactory pressure being maintained in all parts of the district, pressure recorders are fixed permanently at all critical points in the distribution system, and charts are returned daily to the Distribution Department. If there is a difficulty in finding a suitable position



AUXILARY GOVERNOR & INJECTOR CONNECTION 18" GOVERNOR WHYTELEAFE

Fig. 6.

for fixing a pressure recorder, a cast-iron pillar-box is erected on the footpath and a tape chart recorder fitted in the box. These charts are torn off the roll two or three times a week, and give a continuous record of the pres-

sure maintained at that particular point. This arrangement for taking pressures is shown in fig. 7. In addition to the above records, pressures are taken twice a year, at mid-summer and mid-winter, on Saturdays and Sundays

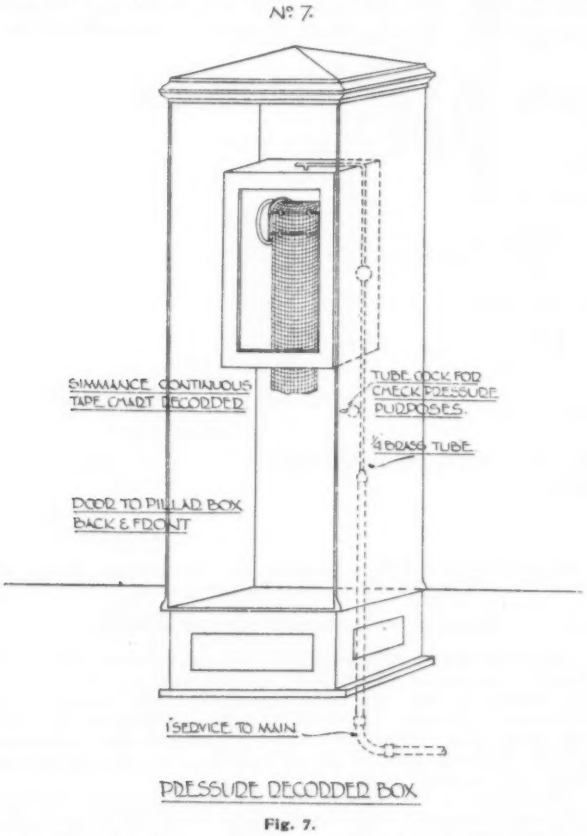

No 7.
SUMMANCE CONTINUOUS TAPE CHART DECODDED
TUBE COCK FOR CHECK PRESSURE PURPOSES.
¼ BRASS TUBE.
DOOR TO PILLAR BOX BACK & FRONT
SERVICE TO MAIN
PRESSURE DECODDED BOX

Fig. 7.

at twelve to fifteen points on each district controlled by either works or district governor. The maximum and minimum pressures are plotted on squared paper, and from these charts adjustments are made in the schedule of pressures maintained on the governors. These charts also reveal any weakness in the distribution system and enable one to determine where it is necessary to enlarge mains to meet the development of the district. This is very necessary in districts which are developing very rapidly.

Syphon Pumping.

All syphons are inspected at least once every seven weeks. It has been found necessary to pump syphons near the works three times a week, and other syphons on trunk mains are classified into weekly and fortnightly groups, according to their proximity to the works.

A 30-cwt. Morris chassis on which is mounted a 150-gallon steel tank is used for pumping all syphons. A small rotary pump driven by a chain from a sprocket fixed on the main shaft of the lorry engine is used for pumping liquor from the syphons into the tank. This method is found quite satisfactory, and one man is capable of inspecting 1200 syphons in the period mentioned.

Office Records.

This part of the organization of a Distribution Department is a very important one. Accurate records of the positions of mains, services, &c., should be kept so that they can easily be found, as this is a means of considerable economy when openings have to be made, particularly where expensive surfaces are concerned. When an escape is reported the position of the main can be ascertained before proceeding to the site, which helps very considerably in tracing the source of the escape. This is particularly desirable when gas is percolating into adjoining premises.

A system is in operation to ascertain the cost of all mains laid, and the cost per yard of labour and materials in each case is calculated. This information enables us to keep a constant check on the cost of the work being carried out by the Department. All work carried out by the service laying section is also costed, and in the case of new services the cost of labour and materials and reinstatement of trenches for all services laid by each service layer is summarized for each size of service at the end of every three months. In the case of the cost of any work carried out by a service layer being above the average the matter is investigated and necessary action taken.

The author then described the method adopted by his Company for keeping these records.

[*Pressure on our space precludes publication of the discussion on Mr. Richbell's paper. Our report will appear in the "* Journal *" next week.*—Ed. "G.J."]

NOTES ON PLANT AND PROCESSES

New Series of Storage Water Heaters.

Messrs. R. & A. Main, Ltd., who in recent years have applied their research and technical staffs to the task of providing modern and reliable water-heating appliances, have just placed on the market a new series of storage water heaters which are the result of their own experiments with earlier types *plus* the benefit of the experience of gas engineers in many towns in which the various types have been tried out.

The new heaters, which have been fully tested, contain many new features, and embrace a range of appliances which will cover every normal requirement in the provision of hot water for kitchen sinks, cloakrooms, hairdressing saloons, surgeries, baths, &c.

In the usual cylindrical shapes, there are the "Thermain" insulated types of 2 and 12 gallons capacity. The former can be supplied with either return or straight-through flue. The "Thermain-Junior" non-insulated types are of 2 and 8 gallons capacity. The No. 2 "Thermain" heaters are supplied with white porcelain enamelled exteriors, and the No. 12 "Thermain" and the "Thermain-Juniors" in china white enamel finish, all with chromium-plated fittings.

Two storage water heaters for the small user are obtainable in the "Domain" (insulated) and "Domain-Junior" (non-insulated) types. Each is of 2-gallon capacity, but as they are circular-shaped with dome fronts their small overall dimensions provide a solution to the difficulty of fitting the usual cylindrical types into spaces above kitchen sinks, &c., where headroom is somewhat restricted by shelves. The "Domain" can be supplied in either white or mottled grey porcelain enamelled dome, while the "Domain-Junior" is available in either china white or mottled enamel finish, all with chromium-plated fittings.

These heaters are all automatically controlled by rod-and-tube type thermostat. They heat up their contents with a low-rated gas consumption and a high thermal efficiency. All have gas adjusters incorporated for suitably regulating the local gas pressure. Any condensed water is caught in a condense tray, and an anti-drip device is provided on each appliance.

Stanton Mechanical Lead Joint.

The Stanton Ironworks Company, Ltd., near Nottingham, have introduced a joint which they anticipate will take the place of the ordinary lead joint for general gas and water distribution purposes. The joint in question follows the design of the Stanton-Wilson self-adjusting joint; but in place of a rubber ring, protected with a lead tip, which is used for all purposes where great flexibility is required, the ring consists of an all lead ring with a thin metallic cylinder encased and hermetically sealed within it.

The Stanton mechanical lead joint can be made without skilled jointers; it is, we understand, no more costly than the ordinary run lead or caulked lead wool joint when laid, possesses a degree of flexibility greater than that obtainable with the ordinary lead joint, is mechanically held in position when once made, and allows of no drawing of the lead joint, although the spigot end of the pipe is free to expand or contract.

The Stanton Company recommend that, where a substantial movement between adjacent pipes has to be met, the Stanton-Wilson self-adjusting joint (rubber ring with lead protected tip) be used; and where the nature of the ground at present admits of the use of ordinary lead joints, that the Stanton mechanical lead joint (all lead ring) be adopted.

This joint is being put on the market for use with the Stanton De Lavaud spun pipe, in sizes up to 20 in. diameter. but at the moment early delivery can only be given of sizes of 4 in. and 6 in. diameters.

: : WESTMINSTER : : TECHNICAL INSTITUTE

Lord Irwin Opens £66,000 Extension

The Gas Industry and the Westminster Technical Institute are closely associated. At the present time a thousand students are receiving at the Institute training in gas engineering and gas supply, and this training is exceedingly well organized and conducted by highly qualified teachers of both theory and practice. From small beginnings in 1893, the Institute has grown steadily; and in 1931-32 there were 2212 students for all subjects, and 509,140 hours' tuition was given.

Wednesday evening last witnessed the opening of a £66,000 extension by Lord Irwin, President of the Board of Education. The new extension is a four-storey building designed and equipped on modern lines, and the old building has been re-modelled in keeping. Here will be the school of cookery and waiting, with restaurant for 150 to supply meals to other students, a gymnasium, boys' messrooms, new rooms for the school of art, new lecture rooms for the gas and structural engineering department, with up-to-date laboratory and a materials laboratory.

THE NEW GAS LABORATORY AT THE WESTMINSTER TECHNICAL INSTITUTE.

The new gas laboratory is splendidly equipped for training in gas supply, the arrangement of the different sections of apparatus, instruments, and appliances constituting an example of economical use of available space. The principles of the utilization of gas in lighting, cooking, heating, and water heating appliances can be impressed upon the student by actual handling of the appliances and the carrying out of tests; similarly, by practical experiment, the student is able to grasp the fundamentals of flow of gas in pipes, photometry, measurement and composition of gas, and the employment of gas in industrial furnaces.

On the day of the opening the Gas Light and Coke Company staged a most interesting exhibit of the type of training given at Watson House, showing samples of the work of boys who are quite definitely becoming craftsmen. The exhibit excited the interest of all the guests—who numbered 150—at the opening ceremony, which took the form of a dinner cooked and served by boys receiving instruction in cookery and waiting at the Institute. The dinner, the expenses of which were defrayed by friends of the Institute, reflected the highest credit on the School of Cookery and Waiting and on the students themselves. Of course, the dinner was cooked by gas. The kitchens are fully equipped with modern gas appliances and are a fine asset to our Industry, ensuring that the future chefs of the country will be, as the best chefs are to-day, " gas minded."

It was unfortunate that the Chairman of the Advisory Sub-Committee of the Institute, Sir Francis Goodenough, who has done such good work for the Institute, was unable to be present at the dinner, owing to his recent serious illness; and in his absence the chair was taken by Viscount Doneraile. Among those present were Mr. Stephen Lacey, a member of the Sub-Committee, and Mr. R. N. LeFevre, Senior Lecturer in Gas Supply and Engineering.

Lord Irwin, in declaring the new extension open, said that the Institute stands for, and exists by, co-operation between industry and commerce and education; and the vital importance of this co-operation to the nation's welfare must be constantly emphasized. The Gas Industry had certainly co-operated in this way, and it was greatly to be regretted that Sir Francis Goodenough, to whom the Institute owed so much, was absent on that occasion through illness. They owed a great debt of gratitude to Sir Francis for his work for the country in bringing together industry, education, and commerce. The recent Report of the Goodenough Committee on Education for Salesmanship stated how important it was for education to keep in touch with industry and commerce. As a preliminary to that, said Lord Irwin, it was equally important that industry and commerce should keep in touch with education. In this respect the example set by Sir Francis was one to be followed—the willingness to assist employees to take advantage of the opportunities of education which were at their door. " This is an age of the keenest competition," concluded Lord Irwin, " and unless we harness our forces we shall not get the best results from our present activities. I congratulate you on the work done in this Institute; it is one of the best things I have seen in my capacity as Minister of Education."

A vote of thanks to Lord Irwin for performing the opening ceremony was moved by Capt. Edward Cobb, Chairman of the Education Committee, who endorsed what Lord Irwin had said about Sir Francis, who had been, and still was, a real friend to the Institute. They had to-day a keen type of student, a first-class Principal in Dr. Long, and a loyal and highly-qualified staff. Lord Irwin's visit would lend added inspiration to their efforts.

The vote was seconded by Sir Isidore Salmon, M.P., Chairman of the Consultative Committee for the School of Cookery and Waiting.

Viscount Doneraile was thanked for presiding on the

motion of the Mayor of Westminster (the Rev. E. St. G. Schomberg), seconded by Mr. Samuel Gluckstein, a member of the Council for the Electoral Division of Abbey, Westminster.

Singing of the National Anthem concluded a memorable dinner, and inspection of the new extension a memorable evening.

OUTSTANDING DATES IN THE HISTORY OF THE INSTITUTE.

1890.—The late Baroness Burdett-Coutts fitted up an old stable on an adjoining site as a workshop for plumbers and metal-plate workers, and started some technical classes known as the St. Stephen's Institute.

1893.—A two-storey building, designated the Westminster Technical Institute, was erected on the present site at a cost of about £5000, to replace St. Stephen's Institute. Facilities for technical and commercial education for the district were made available with the aid of grants from the Technical Education Board of the London County Council.

1900.—Baroness Burdett-Coutts presented the Institute to the Council, and classes were formed for civil engineering, architecture, and the building trades.

1903.—The Westminster School of Art was transferred from the Royal Architectural Museum and became an integral part of the Institute.

1908.—The Institute was enlarged and re-organized. The building trade classes were transferred elsewhere, and in co-operation with the Gas Light and Coke Company instruction in gas supply and the training of gas fitter apprentices were inaugurated.

1910.—A day technical school in cookery was established to provide boys with a three-year course of training for employment as chefs in hotels and restaurants. A school for waiters was added in 1912.

1933.—The present extension was completed at a total cost of £66,000. Additional accommodation designed on modern lines, together with complete and up-to-date equipment, is now available for the School of Cookery and Waiting, the School of Art, and the classes in Architecture and in Civil and Gas Engineering.

Bournemouth Gas and Water Company

ORDINARY GENERAL MEETING

The 112th Ordinary General Meeting of the Company was held at its Offices, 48, Copthall Avenue, London, E.C. 2, on Friday, Feb. 17—Mr. WILLIAM CASH, F.C.A., J.P., Chairman of the Company, presiding.

The SECRETARY (Mr. William Cash, Jr.) read the notice convening the meeting, the minutes of the last annual meeting were read, confirmed, and signed, and the list of stockholders was sealed.

The Chairman's Address.

The CHAIRMAN moved that the Directors' Report and Accounts to Dec. 31, 1932, as presented to this Meeting, be received and adopted.

Discussing the features of the year's work, he said that the sales of gas represented a decrease of 0·33% as compared with the previous year; that was equivalent to a decreased sale of 9 million c.ft., and compared with an increase of a little over 6% in the preceding year. The receipts for gas were down by £17,143, equal to 4·13%. That was due to the fact that the price of gas was reduced at Michaelmas, 1931, and the price during the year under review was 8·2d. per therm in Bournemouth and 9d. per therm in Christchurch; the Bournemouth price wase equivalent to 3s. 0·09d. per 1000 c.ft., at the present calorific value. The average price all over for the year was 3s. 0·89d. covering the whole output, notwithstanding that a higher price was charged in the outside area than in Bournemouth; but substantial discounts were given to certain large consumers. Receipts for gas in 1932 represented nearly 1½d. per 1000 c.ft. less than in 1931.

There was no doubt that the reduced quantity of gas sold was due largely to the mild climatic conditions which had prevailed during 1932, and also to the fact that consumers were economizing. The average consumption per consumer was reduced somewhat on the year, but that was not to be wondered at when one considered the situation throughout the country, and especially the fact that people with fixed incomes had less money to spend.

It was interesting to note how the figures reflected the climatic conditions at the beginning of this year. In January, 1933, the consumption increased by 38 million c.ft. as compared with January, 1931. In one week there was an increase of 25%, and the output on one day was greater than the maximum day output achieved in February, 1929, by a small amount. The figures were extraordinary, and indicated the extent to which business varied according to temperature. The January, 1933, figures were extraordinarily satisfactory.

RESIDUALS BETTER.

The Company had done better with residuals in the year 1932 to the extent of £7000 as compared with 1931. The figure of £7000 included money received from the sale of 'benzole, which the Company was now extracting from gas; that was a profitable transaction which had assisted residual receipts. Deducting the residual receipts from the cost of coal and oil, the year 1932 had benefited to the extent of about 1d. per 1000 c.ft. in net fuel costs.

Commenting on the items in the Capital Account, he said that the Company had opened another showroom during the year, at Winton; this had proved quite successful, and gave additional facilities to the large population supplied by the Company in that part of the area. One set of vertical retorts had been enlarged and improved, and an appropriate proportion of the cost incurred had been charged to Capital Account.

With regard to the water undertaking, the total water receipts were less by about £93 than in 1931. Water rental receipts were down by £131. There again the price had been reduced, at Midsummer, 1931. The additional charge authorized was 33⅓% originally, but in the first half of 1931 the additional charge was, in fact, only 15%; then it was reduced to an addition of 10%, equivalent to a little over ½d. per 1000 gallons.

The Chairman drew particular attention to the fact that new consumers were being supplied, and although the income received for water was £131 less than in the previous year, the quantity supplied was 4% greater. The average daily supply per head had increased substantially.

During the year the capital expenditure on the water undertaking had been increased as the result of the installation of additional pressure filters necessitated by the extra quantity of water supplied. The sedimentation tanks referred to last year were completed, a new cottage had been built at Alderney, and a new 30-in. trunk main between Alderney and Longham was not quite completed during the year. This had involved very considerable expenditure on the connections to the plant at Longham, and part of the cost—£1000—had been charged to Renewal Fund. Notwithstanding these facts, the cost of the repair and maintenance of reservoirs and works was greater by as much as £4444 than in 1931. The profit on the water undertaking was reduced by £8562. The expenses under practically every head, except pensions and Directors' and Auditors' fees, were greater.

The Company had been pressed by the local authorities to reduce the water charges still further. On the usual calculations, the water undertaking had not earned its share of the capital charge in 1932, but no doubt the expenses of 1933 would not be so heavy as in 1932. He emphasized that the charge for water in Bournemouth was very low, and there were no extras. The present charge was 5% on the net rateable value, *plus* 10%—*i.e.*, equivalent to 5½% on rateable value. As an illustration, a relatively small house, rated at £50 per annum, paid 55s. per annum, or just over 1s. per week, for the whole water supply to the house, in which at least four persons lived—for baths, sanitary purposes, cooking, and every other use in the house.

PENSION FUND.

Both undertakings had been relieved in 1932 in respect of the charges to pension fund. The pension charge in the Gas Revenue Account was less by £3864, and in the Water Revenue Account by £584, and the Profit and Loss Account did not bear the charge of £5000, which was made in 1931. That was due to the fact that, on the Actuary's report, the pension fund was in such a condition that it was no longer necessary to make these exceptional additions. The fund had increased by over £20,000 in 1932; that was the income from investments and contributions by the men and the Company, less the amounts paid out for approved pensions. The fund was growing quite satisfactorily.

The number of new gas consumers was 2276, and water consumers 787, and another 23 miles of gas mains and 4 miles of water mains had been laid. The total number of gas consumers to date was 54,635, and water consumers 30,629. In 1933 the Company would be spending a considerable sum on vertical retort renewals, and the Revenue Account together with the Renewal Fund would be available to meet the cost. The Company had bought coal for this year and further ahead at approximately the present prices.

Speaking generally, and having regard to the general financial position, the outlook was not very promising. The area was inhabited so largely by retired persons with fixed incomes that one could not look for very great growth except in so far as the general population in the area continued to grow. There were in the United Kingdom 28 large towns which, in the 1931 census, had recorded increases in excess of 10%. In Bournemouth, the increase was as large as 22%; in Poole, 31%; and in Poole Rural (which covered a considerable portion of the

Company's area), nearly 25%. These figures were extraordinary as compared with those relating to other areas throughout the Kingdom.

The confidence of the public in the undertaking was very evident from the prices of the Company's stocks, which had increased substantially. The sliding-scale stock had been marked at over £200 for £100 stock.

Looking at the Company's accounts, one might be inclined to point out that the gas profit for the year was down by £10,700 and the water profit by about £8500, and to question whether one could regard that as reflecting a satisfactory state of affairs. The answer to the question was that the result was deliberate. The revenue from sales of gas was down by £17,148, and £16,180 of that was due to price reductions; in other words, the Company had deliberately reduced profit by giving further advantages to the consumers. In the same way, water receipts were down by £131, and over £2000 had been given to the consumers by way of reduction of charges, as compared with the previous year. So that, of the decreased profit of £19,185, £18,233 represented reductions of prices to the consumers.

The balance carried forward, as shown by the Profit and Loss Account, was £77,456, which represented nearly a year's dividend. In the same account a sum of £2000 had been written off in respect of the sports ground. It was felt that, while the land was very valuable and had been laid out to great advantage, certain parts of the expenditure incurred, including the cost of a pavilion, and so on, represented the provision of amenities for the workpeople and were hardly in the nature of an asset—and in any case, were not gas or water works. It seemed appropriate, therefore, that the total capital cost should be reduced.

One very satisfactory feature of the balance-sheet was that the Co-Partnership Pension Fund stood at £242,000, of which £227,000 was invested. The market value of the securities was £266,000 odd at Dec. 31, 1932, so that they were worth £39,000 more than the figure in the books. Again, Reserve Fund investments represented £105,861 on the books, but their value at Dec. 31 was £131,278, showing an appreciation of £25,417. The Special Purposes Fund also showed a surplus of £6440. So that the Company's invested funds showed a surplus of £31,000 odd, and the Pension Fund investments showed a surplus of £39,000 odd.

A new item in the balance-sheet was that of Payments in Advance, amounting to £9203. That was really income-tax; the Company had taken advantage of the Government's allowance of 2½% for payments in advance, for that was a higher rate of interest than was obtained from the banks, and, therefore, the appropriate amount was carried forward.

British Waterworks Association Visit.

The item relating to British Waterworks Association expenses, in the Water Revenue Account, was, of course, quite exceptional. The Association had honoured him, said the Chairman, by electing him President for the year to June 30 next, and the Company had had the pleasure of inviting the Association to visit Bournemouth last June. The Mayor and Corporation had very kindly assisted in entertaining the visitors, and the Mayor had been good enough to hold a reception. The Association had had the honour of welcoming the Rt. Hon. Sir Edward Hilton Young, the Minister of Health, at dinner. The visitors, most of whom were experts, were very complimentary both to the Company and its officers with regard to the manner in which the works were conducted and the enormous care devoted to the supply of water in Bournemouth. The visitors had also inspected the gas-works, and some were extremely surprised when they had tea on the lawns in the middle of the works. That was not an experience one could have at all gas-works, which were often regarded as rather dirty and smelly places. They were congratulatory concerning the works, laid out on the designs of Lieut.-Col. Woodall and Mr. Moon (the Company's Engineer and General Manager), in such a manner as to provide plenty of space and air.

Oddly enough, continued the Chairman, he was in the extraordinary position of having been elected President of the British Commercial Gas Association. It was almost unique that one man should hold the offices of Presidents of the two associations in one year. He hoped the Company would have the pleasure of welcoming the B.C.G.A. to Bournemouth in September next, and it could be said with confidence that the gas engineers would be equally as pleased as were the water engineers by the works. The Conference would last only two days, so that it was smaller than the British Waterworks Association meeting. The Corporation had been kind enough to say that they would help to entertain the members of the Gas Industry on that occasion.

The Company had converted its shares into stock, and the Chairman urged the proprietors to send in their certificates for exchange; it would help the office staff if those proprietors who had not already done so would send in their certificates soon.

It was proposed to issue £100,000 of irredeemable 4% debenture stock, and the prospectuses would be sent to the proprietors with the dividend warrants. He did not think it was necessary to commend the issue to them. On this occasion it was proposed to send the prospectuses only to holders of the Company's stock. It would have been easy to have sold the new issue on the Stock Exchange for the best price obtainable, as on other occasions, but the opportunity to acquire it was to be given to the existing stockholders. Taking last year as an example, the net profit on the water undertaking was sufficient to cover the Company's debenture interest, quite apart from the gas profit; the interest on the whole of the Company's debenture stock, including the new issue, was covered about four times by the profits, and the new stock could be recommended as a good investment, particularly as good investments were difficult to find at present.

The resolution for the adoption of the report and accounts was seconded by Sir Charles L. Morgan, C.B.E., M.Inst.C.E. (Deputy-Chairman), and there being no response to the Chairman's invitation to discuss them, it was carried unanimously.

Dividends.

The Chairman moved a resolution confirming the dividends paid for the half-year to June 30, 1932, at 6% on the preference stock, 7% on the maximum dividend stock, and 9½% on the standard 5% (sliding-scale) stock, and declaring the same rates for the half-year to Dec. 31, 1932.

Sir John J. Withers, C.B.E., M.P., seconded.

The Chairman pointed out that the payment of the dividend proposed on the sliding-scale stock represented ¼% more for 1932 than for 1931, and the increase would not be unwelcome. It was still within the dividend which the Company was authorized to declare under the provisions of the sliding-scale.

The resolution was carried unanimously.

Re-Election of Directors and Auditor.

The Chairman, proposing the re-election of Sir Charles L. Morgan, C.B.E., M.Inst.C.E. (Deputy-Chairman), to the Board, said that Sir Charles was a distinguished engineer, a Past-President of the Institution of Civil Engineers, and a Director of a number of gas companies. He was a most valuable Director.

The resolution was seconded by Lieut.-Col. Harold W. Woodall, C.I.E., M.Inst.C.E., and carried unanimously.

The Chairman proposed the re-election of Sir John J. Withers, C.B.E., M.P., and said that he was known throughout the country as a prominent and valuable Member of Parliament and a very eminent Solicitor. His advice to the Board of the Company had been of very great service on many occasions.

The resolution was seconded by Sir George Jessel, Bart., and was carried unanimously.

Both Sir Charles Morgan and Sir John Withers expressed thanks for their re-election.

The Chairman, in a tribute to Mr. Robert H. Glen, F.C.A., the retiring Auditor, pointed out that he was specially qualified to serve the Company as an Auditor because he was a Director and Chairman of other gas undertakings and had a wide knowledge of public utility undertakings. He had served the Bournemouth Company very well in the past.

On the motion of Miss Smith, seconded by Mr. Maxwell, Mr. Glen was unanimously re-elected.

Votes of Thanks.

The Chairman, proposing a vote of thanks to the officers, staff, and workpeople of the Company, said the proprietors knew how well served they were by Mr. Moon, the Engineer and General Manager, who was a specially qualified and most valuable officer, and those serving in other capacities both at Bournemouth and in London. There were nearly 700 members of the Company's co-partnership scheme, and the Chairman bore testimony to the value of that scheme, in the sense that it did increase the zeal and hard work of the employees—if such increase were needed. The Company was very well served from top to bottom, and all the employees had a real interest in its welfare. There was a spirit of *esprit de corps* which was very valuable, and he asked the proprietors to accord with sincerity their thanks to the Secretary, the Engineer and General Manager, and all the officers and workpeople.

Mr. Robert H. Glen, F.C.A., seconding, said that in the course of his work as Auditor he saw a good deal of what happened inside the works and at the offices, and he could assure the proprietors generally that the Chairman had not exaggerated when he had referred to the efforts of the officers and workpeople.

The resolution was carried unanimously.

Mr. Philip G. G. Moon (Engineer and General Manager), responding on behalf of the staff and workpeople at Bournemouth, said they felt, as most employees of public utility undertakings must feel at the present time, that they were fortunate to be able to serve a Company which could give them continued employment. During the past year the Company had employed more people than at any time in its history, and the employees were indeed grateful, particularly when unemployment in industry generally was so widespread. Indeed, they were very much in love with the Company, due largely to the interest shown in their welfare through the co-partnership scheme, and incidentally, by the pension scheme, which, inasmuch as it afforded relief to widows, gave the employees of the Company a sense of satisfaction and safety. The fact that their efforts on behalf of the Company were appreciated by the Directors, as evidenced by the Chairman's remarks, was also a source of gratification, and the workpeople, nearly all of whom were shareholders, would read the account of the meeting with satisfaction.

Mr. W. B. Paton, F.C.A., proposed a vote of thanks to the Chairman for his able conduct of the meeting, and to the Board as a whole for their conduct of the affairs of the Company. The proprietors were fortunate, he said, in having the services of such able Directors.

The resolution was seconded by Mr. Maxwell, and was carried unanimously.

The Chairman, in the course of his response, said he was fortunate by reason of the fact that the Company was served by an exceptional Board, every member of which was a specialist in one or another department.

The meeting then closed.

Horley District Gas Company

ANNUAL GENERAL MEETING

The Annual Ordinary General Meeting of the Proprietors of the Horley District Gas Company was held at the Company's Offices, Station Road, Horley, on Wednesday, Feb. 15, 1933—Mr. H. J. RANDALL (the Chairman) presiding.

The SECRETARY (Mr. Burt Long) read the Notice convening the meeting and affixed the Company's Seal to the Register of Stockholders.

CHAIRMAN'S ADDRESS.

The CHAIRMAN, in moving the adoption of the Directors' Report and financial statement, said that the balance at revenue account carried to profit and loss was a little more than last year. There had been a tangible saving of over £2000 on coal and labour due to the installation of new carbonizing plant, which he referred to at their previous meeting. The repairs and maintenance of plant account, however, showed an increase of £1732, but those costs provided for the liquidation of the suspense account of £1700 created last year in respect of those reconstructions, which had shown such a considerable saving in fuel and working costs. The only other item to comment upon on the debit side of revenue account was expenses of repairs and maintenance of mains and service pipes. During the year under review a good deal had been spent on renewals of mains and services in various parts of their district, but that expenditure had been partly instrumental in reducing the percentage of their unaccounted-for. The unaccounted-for figure for the year was 7%, which was a reduction on previous years, and had meant a saving. At Crawley they had acquired the lease of premises in an important position in the town, and showrooms were opened in August last. He was pleased to say much new business had been the result, in addition to helping their activities in that district, and the opening-up of these showrooms seemed to be much appreciated by their Crawley and Three Bridges consumers. They would also observe that the Horley Showroom had been enlarged since they last met, enabling them to exhibit a much wider range of appliances. The types of apparatus of all kinds had been perfected to such an extent of recent years, due to the introduction of automatic cooking and thermostatically controlled heating, that special attention had been given to showing the many models and types which modern science had produced.

On the credit side of the revenue account, the income from sales of gas showed a slight decrease due in some measure to the general trade depression, although in that Company's area the industrial load was quite small, but mainly due to the mild weather conditions up to the end of December. The last two months of 1932 were exceptionally mild, and made a great difference. So much gas was used for heating that even a few days' mild weather would materially reduce the output. He would mention that for the first half of the year their output showed an increase of 3½%, which might have been maintained had they experienced normal conditions. With regard to residuals products, coke and tar continued to have a favourable market. Their average price per ton of coke was good, and they had a favourable contract for the disposal of the whole of their output of tar. Both these items showed a slight increase over last year's figures. Last year he reported an increase of some £1200 on sale of stoves and fittings, due to the opening-up of new territory within their statutory area of supply, and he was pleased to say that the sales for 1932 were within approximately £600 of that figure; so that although they were £600 down on the corresponding period the sales were £600 in excess of the year 1930. It was quite obvious that if in any one year extensions were carried out, which did not recur the following year, a margin occurred when making comparisons. During the year they had added 208 consumers and fixed 418 new appliances.

GAS STOCKS AND INVESTORS.

The profit and loss account showed, after providing for interim dividends paid in August and the fixed charges for interest, &c., a balance of £4920 17s. 7d., and a proposition would presently be made to pay final dividends which would absorb a sum leaving a balance to be carried forward of £2733 16s. 7d., as against £2578 3s. 1d. brought in. On the whole they had had a very successful year's working, and he saw no reason why they might not look forward to continued prosperity. Gas stocks generally were much favoured by the investing public. Indeed, he believed the present market transactions in many cases were higher than ever obtained before, which spoke for itself of the stability of such a huge Industry, upon which so many other industries were either wholly or partly dependent. In conclusion, the Chairman expressed thanks to the staff and employees for the interest they had shown and the manner in which they had carried out their duties.

Mr. W. H. ELY seconded, and the resolution was carried unanimously.

FINAL DIVIDENDS.

On the motion of Mr. F. A. GREENE, seconded by Mr. L. E. COTTERELL, it was resolved: "That final dividends at the rate of 5% per annum on the preference stock; 10% per annum on the "A" capital stock, and 7% per annum on the additional "B" capital stock (all less income-tax) be paid for the half-year ended Dec. 31, 1932, and that the same be made payable on and after Feb. 22, 1933."

RE-ELECTION OF A DIRECTOR.

The CHAIRMAN then said it was his pleasing duty and a privilege to propose the re-election of his friend and colleague, Mr. F. A. Greene, as a Director of the Company. Mr. Greene was a very able engineer, and the whole of his colleagues appreciated very much Mr. Greene's loyal efforts and support.

Mr. W. H. ELY, expressing pleasure in seconding, said that Mr. Greene's services were extremely valuable to the Board.

The motion was carried unanimously.

Mr. GREENE thanked the meeting for his re-election.

Messrs. Holroyd, Northcott, & Co. were re-elected auditors, on the motion of Mr. A. P. KELSEY, seconded by Mr. J. CHISHOLM.

Mr. B. D. HOLROYD returned thanks on behalf of his firm for the Company's renewal of confidence in them.

ACKNOWLEDGMENTS.

Mr. R. P. NORMAND proposed: "That the best thanks of this meeting be given to the Chairman, Directors, and Staff for their careful attention to the Company's business." The large number of proxies lying on the table, &c., were ample testimony, if any were needed, of the confidence they had in their Directors. He knew three of them in connection with other undertakings, and knew fully how well they were fitted for their task. They all, he felt sure, also owed the greatest thanks to the staff.

Mr. E. BLUNDELL seconded, and the resolution was carried unanimously.

The CHAIRMAN said he wished very sincerely to thank the meeting, on behalf of himself and his colleagues, for the vote of confidence they had given them.

The SECRETARY also suitably replied on behalf of the staff.

Parliamentary Intelligence.

House of Lords.

Private Bills.

The following Gas Bills have been read a second time and committed: South Metropolitan, South Suburban, and East Hull. They are now waiting for Select Committees to be appointed to consider them.

Special Order.

The Special Orders Committee has examined the Watford and St. Albans Gas Order, considered a report from the Board of Trade and a petition from the Hertfordshire County Council, and is of opinion that there ought to be a further inquiry by a Select Committee. The Order is accordingly awaiting the appointment of a Select Committee to consider it.

House of Commons.

Private Bills.

The following Gas Bills have been read a second time and referred to the Examiners: Commercial Gas Bill and Gas Light and Coke Company Bill. The Examiners are also considering the application of the Finsbury Corporation to present a petition against the Gas Light and Coke Company Bill after the period for the deposit of petitions had expired.

Lighting of Gasholders.

On Wednesday last Mr. Perkins asked the Under-Secretary of State for Air whether he was aware of the loss of life that resulted from the recent explosion of a gasholder in Germany, and that there was a new holder over 300 ft. high containing, when full, 8 million c.ft. of gas on the direct air route between Heston and Stag Lane Aerodrome; and whether in view of the possibility of an aeroplane flying into this gasholder in foggy weather, he would take immediate steps in the public interest to place a warning light on the top of this gasholder as was done in similar instances in America and Germany.

Sir V. Warrender said that the general question of the lighting of gasholders, as well as the action which might properly be taken in the particular case referred to, was under active consideration in conjunction with the various interests concerned.

Sir W. Davison asked whether the Air Ministry was satisfied that grave danger might not be caused to the civil population in the event of an aeroplane carrying petrol colliding with one of these vast gasholders which are being set up throughout the country.

Sir V. Warrender replied that this was the reason the matter was being inquired into.

BRITISH INDUSTRIES FAIR, 1933.

GAS SECTION.

Alder & Mackay, Ltd.	11B-3
Asbestos Cement & Building Products Ltd.	11D-1
Ashmore, Benson, Pease & Co., Ltd.	11J-2
Autocontrol Boilers Ltd.	12B-1
Braddock, J. & J.	12C-2
Bray, George, & Co. Ltd.	12H-1
Blood, T. G. Ltd.	11B-2
Bromford Tube Co. Ltd.	12K-1
Cannon Iron Foundries, Ltd.	11F-1
Clarkhills Ltd.	10A-3
Cellactite & British Uralite, Ltd.	12C-3
Chesterton, Jones & Co. Ltd.	11A-1
Cookers & Geysers Ltd.	11K-1
Cowan, W. & B.	12F
Dean, W. H. & Son Ltd.	11D-2
Donkin, Bryan, Co. Ltd.	11L-3
Evered & Co Ltd.	12A-1
Economic Gas Boiler Co. Ltd.	11C-4
Economic Household Appliance Co. Ltd.	11A-3
Emscote Foundry Co. Ltd.	11J-4
Flavel, Sidney, & Co. Ltd.	12E-1
Foster Instrument Co.	12L-1
Foster & Pullen, Ltd.	11D-3
Gas Industry Information Bureau.	12G
Gas Journal, The	12D-4
Grant & West, Ltd.	12A-2
General Gas Appliances, Ltd.	11F-2
Gibbons (Dudley) & Gibbons Bros. Ltd.	10C-3
Glover, George, & Co. Ltd.	11C-2
Glover, Thomas, & Co. Ltd.	11E
Harper, John, & Co. Ltd.	11C-4
Holmes, W. C. & Co. Ltd.	12E-3
Horstmann Gear Co. Ltd., The	12H-2
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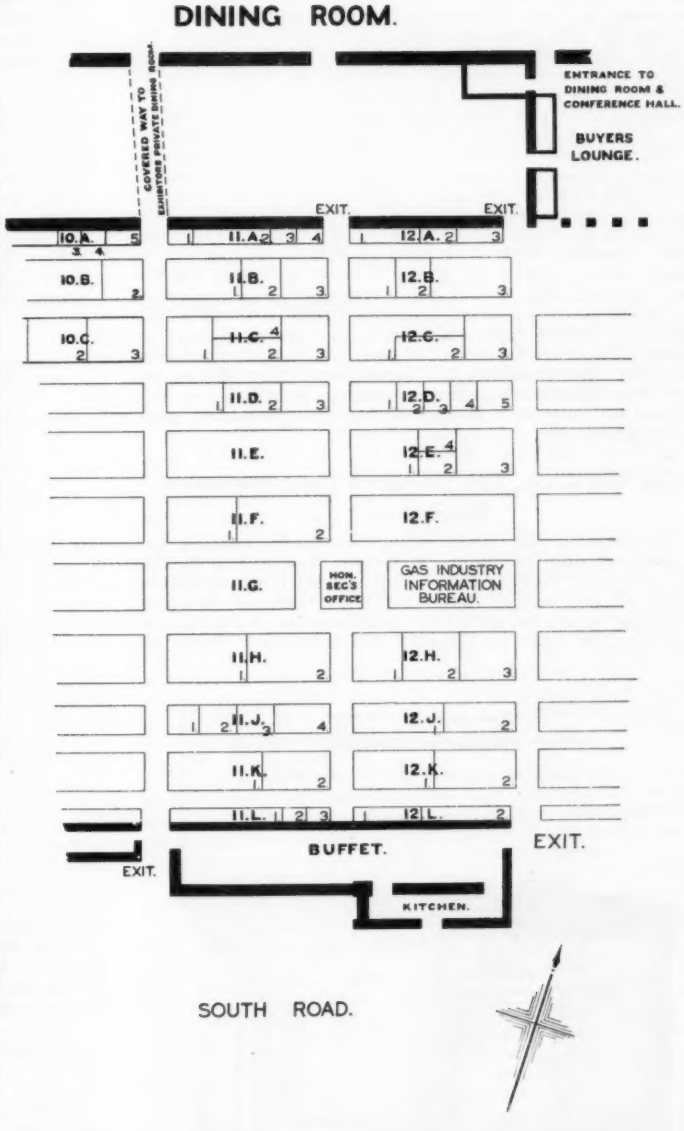
Joint Industrial Exhibit.	11B-1
Lead Wool Co. Ltd., The	10A-5
Lighting Trades Ltd.	12H-3
Macpherson, Donald, & Co. Ltd.	11C-5
Main, R. & A. Ltd.	11E
Meltham Silica Fire Brick Co. Ltd.	12J-1
Metropolitan Gas Meters Ltd.	12B-2
Midland Brass Fittings Co.	12D-3
Moler Products Ltd.	11J-3
National Trades Press Ltd., The	11A-4
New Geysers (1931) Ltd.	12D-1
Orme, George & Co.	11C-3
Parkinson Stove Co. Ltd., The	12F
Parkinson, W. & Co.	12F
Pipe Protection Co. Ltd.	11A-2
Radiation Ltd.	11G
Russell, R & Sons Ltd.	12D-2
Sawer & Purves	12E-4
Stanton Ironworks Co. Ltd., The	12L-1
Selas Gas & Engineering Co. Ltd., The	10C-2
Sigma Instrument Co.	11L-2
Stourbridge Refractories Co. Ltd.	12D-5
Stoves Ltd.	11C-1
Sugg, William, & Co. Ltd.	12C-1
Sutherland, A. G. Ltd.	12J-2
Sutherland, John G. & Sons.	10A-4
Sutherland Meter Co. Ltd., The	11H-2
Timmis & Co. Ltd.	11J-1
Thorp, Thomas, & Co. Ltd.	12E-2
Tubes Ltd.	12K-2
Vulcan Stove Co. Ltd.	11H-2
Walker, C. & W. Ltd.	12A-3
Waterless Gasholder Co. Ltd.	12B-3
Welsbach Light Co. Ltd., The	12H-3
Willey & Co. Ltd.	11H-2
Wilson, Geo. Gas Meters Ltd.	11H-1
Whitehouse, William, & Co Ltd.	12L-2



PLAN OF THE STANDS

WITH NAMES AND POSITIONS OF EXHIBITORS

The Fair is open from Feb. 20 to March 3

Gas Plant and Apparatus at - - Castle Bromwich - -

An Illustrated Account of the Exhibits in the Gas Industries Section of the British Industries Fair

Alder & Mackay, Ltd.,

New Grange Works, Edinburgh.

Messrs. Alder & Mackay, Ltd., are showing a representative range of their high-capacity and standard dual coin prepayment and ordinary tin-cased meters. Some of the exhibits are fitted with glass panels and are passing gas, so that the construction and action of the meter may be observed. They take this opportunity to show for the first time one of their new small high-capacity meters in tinplate case. This meter, which is of the same case dimensions as the No. 1 standard meter, is constructed to pass 100 c.ft. per hour. Though it is not yet in production, the firm are introducing to their customers for the first time their optional coin meter designed to accept pennies or shillings.

They also show a 5 c.ft. standard test holder of the latest model, together with a 20-light standard test meter, a leakage meter, and a set of the relative gauges. On the street lighting side they exhibit representative models of their hurricane-proof street lanterns, fitted with clock controllers, the latest types of burners, and stainless steel reflectors. The various models of the " A. & M. " clock controller are also available for inspection. Also shown are items from the firm's range of sundry specialities—a dry portable test meter, a special demonstration meter, pressure registers, &c.

Arden Hill & Co., Ltd. (Radiation Ltd., Proprietors),

Birmingham.

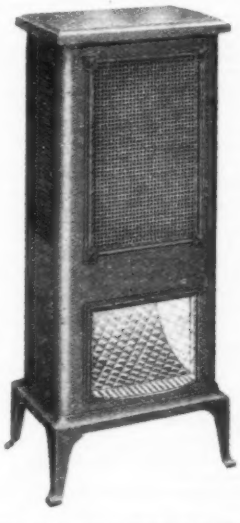
A particularly fine exhibit of appliances for heating and hot water supply is made by Messrs. Arden Hill & Co., Ltd., of Acme Works, Birmingham, who make a special feature of the new " Acmefont " for central heating. This heater is shown operating radiators, as well as in section, to make clear its detailed construction. Both exterior and interior surfaces are porcelain enamelled, preventing the firm adhesion of lime deposits, and it is thus suitable for either hard or soft water.

Arden Hill's "Acme" "New World" Range.

Of particular interest to hotels, caterers, and other establishments needing a considerable volume of hot water, is the " Sun " water heater. This thermal storage heater gives an output of 18 gallons of water at 140° F. per hour, with a gas consumption of 50 c.ft. per hour. The efficient safeguard—the " Regulo "—is introduced to such good purpose that the maintenance consumption is as low as 2 c.ft. per hour.

The " B.T.U. Junior " water heater is for use with existing hot water installations, and may either supplement the back range boiler, or serve as an independent unit. It is a remarkably efficient heater, economical to install, and low in maintenance cost; the full-on gas consumption is only 10 c.ft. per hour, reduced by the " Regulo " to a maintenance consumption of 2 c.ft. per hour.

A most attractive item in this exhibit is the " Acme " " New World " gas range in a new colour scheme, " sunshine " yellow and buff. This combination of colours is bound to make a wide appeal.



Arden Hill's "Console" Cabinet Radiator.

Reference must be made to the " Console " cabinet radiator—a new design—which opens up a fresh field for gas radiator heating. The specimen on display is of mahogany wood grain finish, and there are available a wide range of colours, suitable for every character of decoration.

Asbestos Cement Building Products, Ltd.,

Trafford Park, Manchester.

This firm have a full display of gas-fired appliances of all types, including cookers, wash-boilers, geysers, &c. A large number of adaptors can be seen, these being specially made for many proprietary gas appliances in addition to the latest types of bafflers, cowls, and other anti-down-draught devices. In addition to the range of flues for gas-fired appliances, a heavier range of material is also shown for slow combustion stoves, this being somewhat thicker in the wall, to prevent the possibility of any chilling in the flue, which might tend to check the smooth upward flow of the products of combustion. The natural insulation in the wall of the pipe helps very much in this respect and retains the heat in the flue where it is wanted, instead of radiating it from the outside of the pipe, as in the case of metal.

Various large-diameter pipes and fittings are also shown up to 48 in. diameter, these being used in connection with industrial applications of gas and also for ventilating shafts, &c. In construction of the stand Asbestos Cement Building Products, Ltd., have incorporated many " Turnall "

materials which are now manufactured by them including asbestos wallboard, oak-grained asbestos panels, stipple-glaze decorated sheets, and an item which has caused great interest among housing authorities—the " Everite " asbestos-cement draining board.

Ashmore, Benson, Pease & Co., Ltd.,

Stockton-on-Tees.

This firm are showing a model of a waterless Klönne gasholder. This model, which is to a scale of 1/60th full size, gives a good idea of the outside of these holders, which are of cylindrical shape. A portion of the side of the model is cut out and replaced by sheet glass, permitting a view of the top of the piston, the chain ladder, and the inside of the holder.

Particulars are available of the benzole recovery and rectification plant supplied by the firm. The plant incorporates the special type of column designed by their Associates, Messrs. E. B. Badger, Sons, & Co., Boston, U.S.A., as well as a high-efficiency heat exchange system, and arrangements for varying the grade of product produced. The claims for the plant are low steam and water consumption and flexibility in operation.

Another exhibit is the " Linatex " valve, which consists of a cast-iron body, lined with " Linatex," and a cast-iron butterfly disc carried on a steel shaft. The disc is made slightly larger than the bore of the lining, so that when the valve is closed the disc compresses the " Linatex " and forms a pressure-tight closure.

" Linatex " is manufactured from fresh rubber latex, and comprises 90% pure rubber, to which has been applied a special chemical treatment. The resultant product has a permanent resiliency and great resistance to abrasion, compression, and chemical action. It has a non-clogging surface, and does not deteriorate with age.

Valves up to 12-in. bore are opened and shut by a hand lever, but above this diameter a worm reduction gear is employed to facilitate the operation.

The valve is made in any size to suit customers' requirements.

Autocontrol Boilers, Ltd.,

Victoria Station House, London, S.W. 1.

" Vesta " gas-fired boilers are being exhibited on the stand of Messrs. Autocontrol Boilers, Ltd. The " Vesta " boiler employs a new process of burning gas. A perfect mixture of gas and air is obtained by fixed air and fixed gas settings and burned under reduced pressure conditions in a special furnace, resulting in a flame temperature of 2800° F. No free air or oxygen is admitted, so that combustion conditions are always positive and perfect, irrespective of climatic conditions. By the " Vesta " process, the boiler has periods of active combustion and inactive intervals. Controlled by a thermostat, during periods of activity, the mixture is burned in a refractory material, and the resultant heat in the refractory is radiated to the boiler during both active combustion and inactive intervals. The products of combustion pass downwards under control and are extracted at a temperature of only 10° to 15° above the return water temperature of central-heating installations. During inactive periods, the boiler is sealed and no current of cold air is permitted to pass through; therefore the heat conserved in the refractory and the boiler itself is all utilized or exchanged into the water of the system.

By this process, in the case of central-heating and hot-water supply, the effective B.Th.U. transmitted to the circulating water represents 90% of the thermal value of the gas, in the case of steam raising 85% is transmitted.

On the stand are exhibited the following boilers: A " Vesta " gas-fired boiler, capable of 100,000 B.Th.U. per hour; a gas-fired boiler capable of 250,000 B.Th.U. per hour; the L.S. type " Vesta " gas-fired steam boiler, size 36H.S., capable of evaporating 500 lbs. per hour at 25 lbs. pressure; and an H.S. type " Vesta " gas-fired steam boiler, size 16, capable of evaporating 6000 lbs. per hour at 120 lbs. pressure.

" Vesta " boilers are controlled by a thermostat in the case of hot water boilers and by an electrical connection in the pressure gauge in the case of steam boilers. The thermostat can be fixed at a distance or in the return waterway. The thermostat in the case of hot water boilers, or pressure gauge for steam boilers, operates a relay which in turn starts the motor and fan, reducing the pressure in the flue-ways and boiler furnace 2 in. W.G., which operates a valve lifter and opens the gas-control valves, causing air and gas to flow through the mixing tubes and atomizers into the furnace where it meets the pilot flame and is ignited. In the case of water boilers, the products of combustion are drawn downwards from the furnace to the bottom of the boiler through the fan case, after which they are forced up the flue. In the case of H.P. steam boilers, the furnace is in the base of the boiler, the products of combustion are drawn up to the top bank of horizontal tubes, after which they pass downwards under the influence of the fan, through another two traverses banks of tubes, to the fan case, where they are exhausted, after which they are delivered up the chimney.

Birmingham Gas Department.
Industrial Gas Development Section.

The Birmingham Gas Department are continuing their series of exhibits in the Gas Industries Section with a view to bringing before manufacturers some of the latest developments with regard to the application of town gas to industrial heating processes. The space available this year has not permitted the usual demonstration of a furnace or furnaces working under practical conditions, demonstrating heat-treatment operations with quenching apparatus on a practical scale.

The arrangement of the stand conforms generally to the special scheme adopted by the Gas Industries Section, and the exhibits are as representative as possible, in so small a space, of the general activities of the Industrial Research Laboratories, including advisory work to manufacturers with regard to the application of gas to industrial processes, physical, metallurgical, and chemical testing, and heat treatment.

In addition to this stand, the Birmingham Gas Department are co-operating with the British Commercial Gas Association in the exhibition of a number of gas furnaces and industrial appliances on Stand No. 11B, which is a Joint Industrial Gas Exhibit.

Sheffield Gas Company.

One of the most interesting recent industrial gas furnace developments is the patent controlled atmosphere, high-temperature heat-treatment furnace which has been evolved by the Sheffield Gas Company for the heat-treatment of high-speed steel without distortion, a minimum of scaling, and without decarburization. This particular furnace is shown by arrangement with the Sheffield Gas Company under working conditions; demonstrations are being continually given, and manufacturers are invited to send in sample tools for treatment.

The following is a description of the working and the claims of this furnace: The twin-chambered furnace is designed to meet the very exacting requirements for the successful heat-treatment of high-speed and alloy steels. At the very high temperatures required for the hardening of tools and machine parts made of high-speed and alloy steel the tendency to form scale, to decarburize, and to excessive grain-growth is very pronounced. The ancillary equipment to this furnace is such that it enables the three difficulties just mentioned to be overcome, by enabling a controlled atmosphere to be passed into both heating chambers.

The two-chambers of the furnace are muffles, heated by gas and air blast in such a way that the proportion of air to gas is under definite control, and it can be assured that optimum combustion occurs, and, consequently, no free oxygen remains in the products of combustion.

The ancillary equipment is such that it very materially lowers the water vapour content of a part of the products of combustion drawn from the heating chamber of the furnace, and by virtue of the thermal circulation of gases produced and the volume of gases used, a positive pressure is set up inside the muffles, and so air from outside is excluded. The prepared gases in the muffles are themselves such as have a very low scaling and decarburizing propensity, but the effects in this direction of the low amount of water-vapour and carbon dioxide content are counterbalanced by addition of a small, controllable quantity of unburned town gas. By means of two control stop-cocks, one governing the volume of products of combustion taken from the furnace and one governing the volume of unburned gas added to those products, a mixture of gases can be produced and passed into the muffles which will allow high-speed or alloy steels to be heated at their optimum temperatures without the formation of scale and without any decarburization. This means that articles of high-speed steel and alloy steel can be heated at 1350° C. with the formation of not more than 1/10th of a thousandth of an inch of scale, and no decarburization, and so expensive machining and grinding is eliminated, resulting in a saving of material and labour costs.

The furnace is capable of being heated to 1400° C. with a gas consumption of 500 c.ft. per hour. To maintain the furnace at 1300° C. requires only 380 c.ft. per hour. The amount of gas required in addition for atmosphere control is less than 2% of the gas used for heating. Air at 1-lb. pressure is used.

The preheating chamber embodies new features of de-

sign in that it is capable of temperature control by a suitable arrangement of flues and dampers. The use of muffles as heating chambers allows more exact temperature control than does an open type of furnace, as the heating is done purely by radiation.

SUMMARY.

Type of Furnace.—Twin-chamber high-speed steel heat treatment furnace, with controlled atmosphere.

Gas Consumption.—500 c.ft. per hour for 1400° C. 380 c.ft. per hour to maintain 1300° C.

Air Pressure.—Not less than 1-lb. per sq. in.

Atmosphere Control.—The waste products of the furnace are used in such a way that, with the addition of a very small amount of unburned gas, they prevent the formation of scale or of decarburized material at any temperature up to 1380° C. The mixture of treated waste gases and unburned gas is capable of exact proportioning and mixing.

Incandescent Heat Company, Ltd., Birmingham.

A great deal of attention is now being paid by the designers of gas-heated oven furnaces to the question of conveyors, to improve throughput and thereby the overall efficiency of the furnace. Representing this work, the Gas Department are showing a standard type of gas-heated oven furnace, in this case made by the Incandescent Heat Company, Ltd., complete with a conveyor system embodying a continuous feed wire mesh conveyor belt constructed of nickel-chrome wire by Messrs. Geo. Lane & Sons, Birmingham. This furnace is representative of the types generally suitable for annealing, normalizing, and hardening operations, and in the case of the furnace shown is particularly suitable for the heat-treatment of small components. Special attention is called to the belt, which is of a type found to be very satisfactory in use.

Brayshaw Furnaces and Tools, Ltd., Manchester.

Messrs. Brayshaw Furnaces and Tools, Ltd., who are well-known makers of gas-heated furnaces for the heat-treatment of carbon and high-speed steel tools, are co-operating with the Birmingham Gas Department in the exhibition of a special furnace for the tipping of steel tools with " Widia " and similar materials for which there is a demand at the present day. This furnace is shown working, and is available for practical demonstrations.

Morgan Crucible Company, Ltd., Battersea.

Furnaces used for the calibration of temperature measuring apparatus are always of interest. The Morgan Crucible Company, Ltd., of Battersea, have recently developed a small tube furnace which they claim to be particularly suitable for the calibration of pyrometers and for laboratory or small heat-treatment work requiring temperatures up to 1300° C., and a furnace of this type is being shown on this stand as a complete unit, with blower, &c. The makers claim that the furnace will attain its maximum temperature within ¾-hour of lighting up. The furnace is shown at work, and is available for inspection and test with suitable pyrometer equipment by anyone interested.

Silas Hyde, Birmingham.

A small double-cased drying stove is shown, made by Mr. Silas Hyde, of Birmingham, which is suitable for general drying operations such as core drying, japanning, &c. This stove is well constructed with the usual double casing of sheet-steel packed with a high-quality insulating material, is fitted with the latest types of burners supplied by this particular firm, and is also thermostatically controlled by a direct-acting " Spersom " thermostat made by Messrs. Sperryn & Co., Ltd., of Birmingham.

Chance Bros. & Co., Ltd., Smethwick.

A range of small gas and air blast burners are shown with very fine flames suitable for glass blowing, glass finishing, and similar operations, these burners being a new development by Messrs. Chance Bros. & Co., Ltd., of Smethwick. One or two of these burners are connected up and available for demonstration.

High-Pressure Gas in Cylinders.

The intense interest which has been created recently in the application of gas stored in cylinders at high pressures for the running of motor vehicles is being demonstrated at the Fair, and as the Birmingham Gas Department have received so many inquiries with regard to the application of gas in cylinders for other purposes, such as house lighting, heating and cooking, picnic equipment, house-boats, and several other domestic or industrial purposes, for positions where gas supplies from the main are difficult to obtain, they have arranged a small demonstration of gas cylinders supplying lights and ordinary ring burners, with a view to demonstrating the possibilities of gas in this direction.

Pyrometer and Control Equipment.

Temperature measuring instruments are now recognized as an essential part of any industrial gas heating equipment. The Gas Department have arranged a number of pyrometer outfits to be available and at work on the various furnaces on this stand, the makers represented being Messrs. Electroflo Meters Company, Ltd., Cambridge Scientific Instrument Company, Ltd., the Foster Instrument Company, and R. F. Hamilton & Co., Birmingham.

Physical Testing Section.

The exhibit takes the form of a number of small machines dealing chiefly with the various hardness determinations on metallurgical products.

An Avery Direct Reading Hardness Machine.—Specially designed for rapidly determining the hardness of materials in terms of standard penetration numerals. These numerals are based on the depth of impression produced by a standard penetrator under the action of a definite major load, super-imposed on the impression produced by a definite minor load, so that the errors due to surface imperfections of a specimen are eliminated. In this machine a hydraulic speed controller is incorporated, the speed of this control being obtained by regulation of a needle valve. Provision is made for either steel ball or diamond penetrators, and the depth measuring gauge takes the form of an extremely accurate dial instrument giving direct readings in terms of two standard penetration scales, B and C.

Avery Dead-Weight Brinell Testing Machine.—For investigational work and workshop routine tests. In this machine the measurement of the load is by means of a weighing mechanism consisting of cast steel levers fitted with hardened steel knife edges and bearings. Arrangements are made for carrying out tests with the 3000 kgms. and 10 m/m ball, and the usual variations of loading with the same size ball or down to 30 kgms. with 1 m/m ball.

T. G. Blood, Ltd.,

31-38, William Street North, Birmingham.

This firm are showing a range of their " Mermaid " products, including water heaters, towel rails, gas kettles, bowl fire screens, panel fittings, &c.

Their 10-gallon capacity gas water heater is an attractive appliance, which can be supplied with heat resisting japan in white, cream, or various cellulose finishes, bright or antique copper. Any number of taps can be supplied upstairs or downstairs, below the level of the heater. The appliance is fitted with thermostatic control. The 5-gallon size is supplied with brackets for fixing to the wall, while a length of rubber tubing is included. As in the case of the larger appliance, the temperature can be adjusted simply by setting the thermostat dial to the required heat.

The " Mermaid " bowl fires are of both the screen and pedestal type in a number of attractive finishes. The gas kettle is suitable for taking from room to room, as only a flexible tube is required.

J. & J. Braddock,

London and Oldham.

Messrs. J. & J. Braddock are showing on their stand a full-size 12-in. station governor arranged for water loading or weights. The governor has sufficient seal to withstand pressures up to 20 in. of water, but can be arranged for still higher pressures. On the stand is also a patent retort house governor with a new valve so constructed that high vacuum conditions do not adversely affect the desired conditions in the foul main.

There are also exhibits of standard, high-capacity, and small high-capacity dry gas meters with the new two-coin attachment and seamless diaphragms; also glass case meters to show the internal construction; a wet meter with improved drum of ordinary type; and their new patent double drum wet meter, which will pass increased hourly quantities of gas with minimum loss of pressures. Another feature of this meter is that it allows a large amount of water to be evaporated for the 5% range in registration. There are also various forms of pressure gauges and high-class main cocks among the exhibits.

Geo. Bray & Co., Ltd.,
Leeds.

This firm are again exhibiting a wide range of burners for incandescent and ordinary (flat flame) coal gas, petrol air gas, and acetylene. Since the last Fair they have introduced a device for incandescent burners known as the Bray silent regulator. Used in conjunction with the Bray diffuser, the device ensures a practically silent burner, and even without the diffuser noise is greatly diminished. Here the regulator can be seen in operation and compared with the same burner without the device. Another interesting exhibit is the dust-proof burner specially designed for poultry cabins, factory and workshop use, &c. Burners for street lighting will interest the technical man and engineer.

To make sure that the best results are obtained from their burners, this firm offer four sizes of XXX quality mantles. A full range of Bray acetylene burners is also on view.

Bromford Tube Company, Ltd.,
13, Victoria Street, London, S.W. 1.

The advantages attached to seamless steel pipes are now widely recognized and acknowledged by gas and water supply authorities. Steel is finding increasing favour and is being extensively used for the distribution of gas and water supplies in the towns and cities. In this connection the stand of the Bromford Tube Company, Ltd., is of special interest.

This firm manufacture weldless steel tubes for all purposes from ¾ in. to 16 in. outside diameter; and, in addition to a wide range of general exhibits, those interested in the Gas Industry may see a 16-in. outside diameter gas main over 40 ft. long, dipped in bitumastic solution, wrapped with

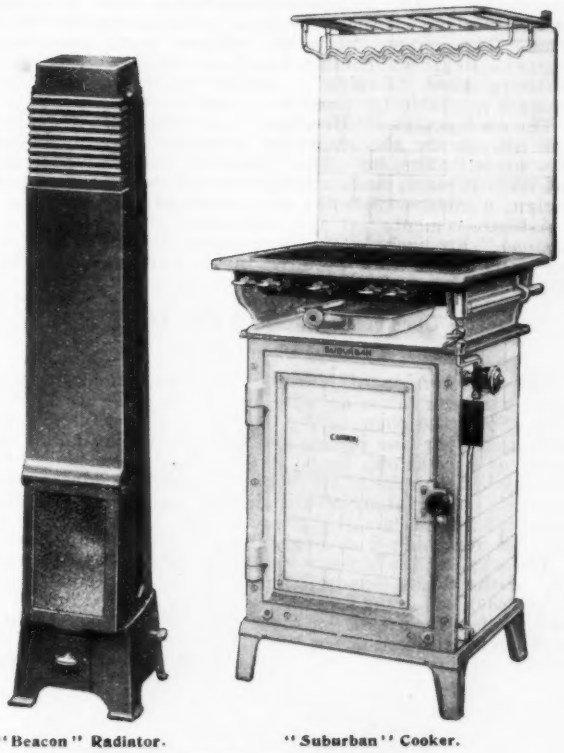
A Large Bromford Gas Main being Welded on Site

impregnated hessian, and coated with pure bitumen. This tube is one taken from a large contract recently executed in the north of England, and was rolled in the extensive tube-making plant at the Bromford Tube Company's works, where the largest hot rolled weldless steel tubes in Great Britain are made.

The exhibit also includes a selection of smaller sizes of gas mains, special fittings, and syphons, &c. There is, too, a representative range of the latest designs of tubular steel gas street lighting columns, which have been adopted by over 200 public lighting authorities.

Cannon Iron Foundries, Ltd.,
Deepfields, nr. Bilston, Staffs.

Cannon Iron Foundries, Ltd., are the sole makers of the new inclined gas fires with a principle of construction which enables the sloping radiants to be set at the correct angle for uniformly heating the room with a small gas consumption, and the exacting demands of modern hygiene are fully met by the effective ventilation which the design ensures. A great demand is made for the art copper bronze, silver, and gold finishes, and the varied tastes of the discriminating are provided for in the art metal antique sheathed finishes in copper, brass, and pewter. The "Vitaglo" radiant is now supplied with Cannon fires.



"Beacon" Radiator. "Suburban" Cooker.

CANNON SPECIALITIES.

The "New Challenge" high-grade gas cookers are thoroughly up-to-date and embody all the modern points of practical construction. The "Superb" enamel finishes in light or dark green, primrose, and cream are of real artistic merit, eminently suitable where special colour schemes are desired. In "Porceliron" mottle enamelled finish, these cookers present a beautiful appearance, and the smooth, clean surface of the enamel is hard, durable, and very easy to clean. The "Autimo" oven heat controller is perfectly reliable and takes charge of the food, giving relief to the busy housewife who can use to advantage the time thus saved. "Suburban" high-grade gas cookers are exceptionally attractive in the "Superb" finishes. The oven, with a specially constructed bottom flue, ensures a high efficiency, prevents short circuiting, gives a very even heat, and eliminates condensation. Intermediate cookers are well represented by the models of "Oxford" and "Cambridge" series.

The "Beacon" radiator combines beauty with efficiency, and admirably meets the requirements of modern architecture and decoration. It is designed to give the right degree of warmth in halls, corridors, bathrooms, offices, and shops, and is particularly suitable for rooms which are subject to draughts or where warm air is constantly being lost through the frequent opening of doors. This appliance is made in one, two, or three column sizes in coin bronze finish, and if desired can be supplied with a convenient boiling burner concealed in the hinged top.

Cellactite and British Uralite, Ltd.,
296-302, High Holborn, W.C. 1.

Examples of "Cellactite" steel-cored roofing are shown. This is the alternative to short lived corrugated iron or asbestos-cement for industrial roofing and side cover. It has a steel core completely enveloped in protective bitumen to which is subsequently applied on each side an imperishable asbestos-asphalte felt, having all the endurance of a road asphalte. These coverings are applied under great hydraulic pressure resulting in a perfect bond and a composite sheet that is claimed to outlast the building itself without a single painting or repair. A new feature in "Cellactite" sheeting which is shown is the rough texture finish in colour. For a long time there has existed in certain work a need for special appearance conformable with any surrounding, and the new rough texture Cellactite meets this need.

"Uralite" is also shown; this is a well-known name often misused in mistake for the commonplace flat and corru-

gated asbestos-cement sheeting of any manufacture, British and foreign. It is stressed that "Uralite" (which is a flat board and not made corrugated at all) is composed practically entirely of high-grade asbestos fibre. It is not an asbestos cement sheet, which is merely incombustible in itself. The genuine "Uralite" will not crack under high temperature; it will confine a fire to its source. Specimens of the genuine "Uralite" product are shown and small samples available for those interested.

The ever popular "Urastone" non-corrosible flue pipes and fittings are also shown in extensive range, including new cowls, baffles, &c. The "Shorne" baffle is a specially interesting piece, and, cutting out all embellishment of design, combines efficiency with economy.

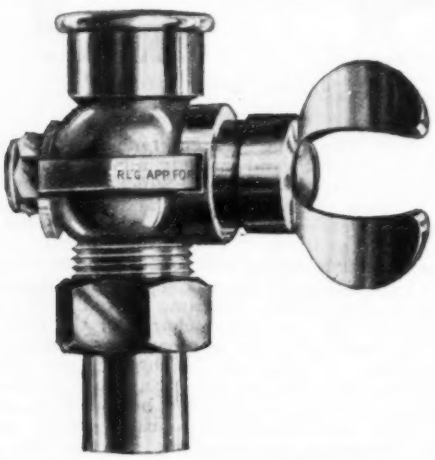
Asbestos-cement, flat and corrugated sheets, and "Asbestone," are included in the exhibit; together with expressions of the same material in tile patterned sheeting, gas cooker bases, &c.

Chesterton. Jones, & Co., Ltd.,

Tyseley, Birmingham.

The Directorship of Messrs. Chesterton, Jones, & Co., Ltd., has been taken over by Messrs. Berkeley & Young, Ltd. Since the changeover, the firm have completely reorganized their Gas Section and are still trading under the name of Chesterton, Jones, & Co. They have placed on the market a range of small brass fittings, pendants, and brackets. By making a speciality of these lines and narrowing down the number of productions, they are able to produce very high-class goods and prices are competitive.

The stand at the Exhibition is fitted with a plentiful supply of the firm's standard lines. Included is an original safety cock which the firm have placed on the market. The cock is ideal for use on gas fires, wash-boilers, cookers, &c., or anywhere where there is a danger of an irresponsible person turning on the gas. It has been very well received



Chesterton, Jones, and Co.'s New Safety Cock.

by the trade and is a big step forward for this particular line. Another useful development is the special stiffened barrel which has been standardized on the small "Fullway" ½ in. gas cocks. By stiffening the barrel at its weakest point, squeezing by the fitter on installation is overcome.

Clarkhills, Ltd.,

31, Vauxhall Bridge Road, London, S.W. 1.

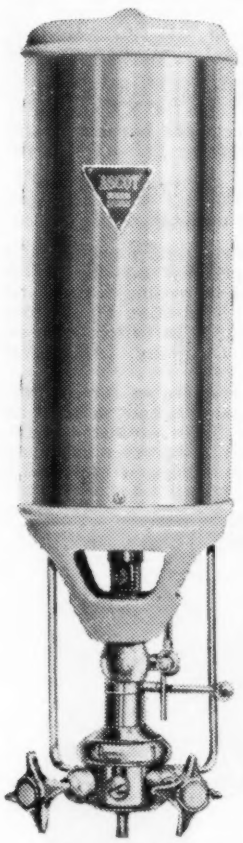
Messrs. Clarkhills, Ltd., are exhibiting and demonstrating on their stand the "Clarkhill Minor" thermostatically-controlled automatic multi-point gas water heater. This new machine is far in advance of the old type, both in construction, and safety, and wear, as the thermostat prevents users from overheating the machine, and also acts as a safety device, should the automatic valve fail to function owing to foreign matter being present in either gas or water services. The heater is the smallest multi-point machine made by this Company, having an output of 3 gallons per minute, and is capable of supplying a good hot bath, in the winter, in 10 minutes. It is now possible to obtain all "Clarkhill" heaters, in white or in any desired colour enamel, apart from the standard finish of oxydized copper.

There is also being exhibited the "Vauxhall" storage heater. This machine has a capacity of 2 gallons, and is ideal for doctors or dentists, having a mixing tap, so that it is possible to obtain hot and cold water, or a mixture of both. This heater is also very useful for sinks or hand basins, in houses or offices, where only a small quantity of hot water is required. Being thermostatically controlled, it is very economical, as, when the water in the container reaches a temperature of 160°, the gas jets are cut down to the minimum.

Cookers and Geysers, Ltd.,

244, High Holborn, London, W.C. 1.

This firm show different types of "Ascot" gas water heaters in their natural surroundings. With this object in view, the stand has been divided into different sections representing the following exhibits:



The "Ascot" Sink Gas Water Heater.

All Gas Kitchen.—Showing the "Ascot" multi-point gas water heater, type NEA.38, white enamelled, all bright parts chromium plated. This apparatus supplies hot water instantaneously and in unlimited quantities to sink, bath, lavatory basins, and any other points required. Also shown is the "Ascot" gas sink water heater, type R.12, chromium plated and white enamelled, giving instantaneous supplies of very hot water for kitchen purposes. Hot, cold, or tepid water may be drawn off at will instantaneously.

Bath Room.—Here are to be seen "Ascot" shampoo gas water heater, type A 3/6, chromium-plated, and "Ascot" bath gas water heater, type R.25, chromium-plated and white enamelled.

A Hairdressing Cubicle contains an example of the "Ascot" shampoo gas water heater, type A 3/6 BB, chromium-plated—an ideal appliance for the hairdresser.

Dental Surgery.—Here is an "Ascot" gas water heater, type A 3/6, chromium-plated.

Technical Section.—This section gives technical details of the "Ascot" gas water heaters, showing the "Ascot" multi-point heater, type NEA.25, connected as an alternative to an existing coke boiler hot water system. Here also is an "Ascot" sink gas water heater, type R.12.

W. & B. Cowan,

Fitzalan Street Works, London, S.E. 11.

The progress of the development in the design of gas meters is a special feature on this stand, ranging from the original "lights" size to the "Midget" high-capacity meter, but the outstanding exhibit is the new Universal "Super-Two" coin meter, which is optional for either pence or shillings, or can be altered to operate with single coins, *in situ*, for pennies only or for shillings only, at the will of the gas undertaking. The interchangeability of the parts comprising the "Super-Two" mechanism is well illustrated in this exhibit.

The advantages of the "Ferro" dry gas meters are again shown, especial attention being drawn to the easy manner in which this type of meter can be repaired by unskilled labour. A working model of the bell type station meter is also shown, and attention is drawn to the possibility of the conversion of existing rectangular station meters to three times the original capacity within a loss of 5/10ths in. pressure.

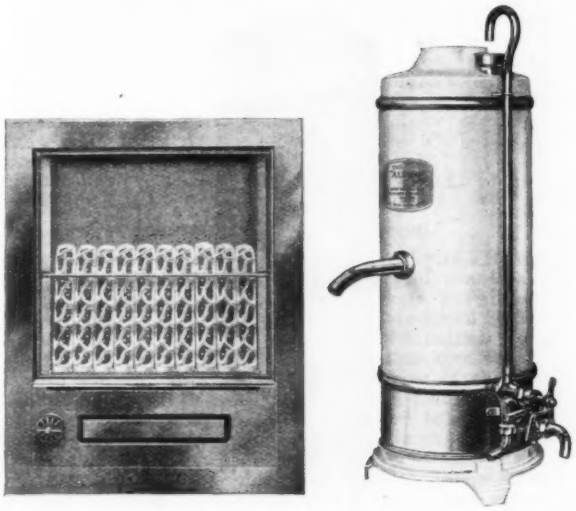
A further interesting exhibit is a working model of the ST type positive rotary piston water meter, of which more than half a million are in successful use. This meter was introduced some years ago to take the place of the reciprocating piston type of meter, also of inferential meters, over which it has advantages in lower initial cost and accuracy, especially at low flows. It is sensitive, constant in measurement, has a long life, and is easy to maintain.

Davis Gas Stove Company, Ltd.
(Radiation Ltd., Proprietors),

London and Luton.

This firm are contributing to the comprehensive nature of the Radiation water heater display by showing examples

of their " Alpine " geyser and " Shamrock " geyser. There is a continuously increasing demand for Davis geysers.



" Panella " Fire. " Alpine " Geyser.

DAVIS FEATURES.

Particularly in regard to the finishes in which these geysers are supplied, the improvements invite attention. Porcelain enamels of colour purity and flint-hardness are used in conjunction with bright chromium plated fittings, giving a most inviting appearance to this useful quick-service appliance.

W. H. Dean & Son, Ltd.,
Burnley.

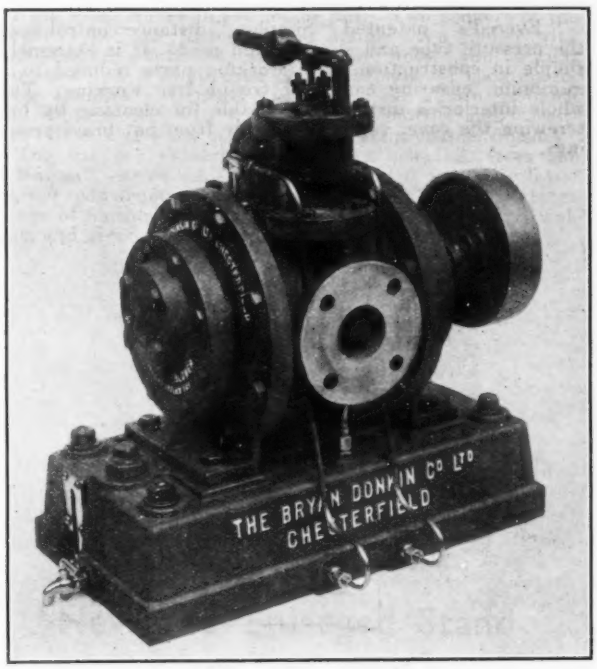
Gas-heated wash boilers in large variety of patterns and prices, with or without draw-off taps, are exhibited on this stand. The firm's patterns include those with outer casing of strong sheet-steel and porcelain enamelled black and white mottled finish. Special wood covers can be fitted which can be reversed to form a small table for kitchens where space is limited. Copper water heaters and counter urns for restaurants, workshops, &c., rustless cast-iron pan boilers for butchers' use in brawn making, gas-heated washing machines, stove piping, corrugated elbows, ventilating caps, tee-pieces, patent bafflers, &c., and the " Maxol " patent geyser for providing boiling water instantly, are among the exhibits.

Bryan Donkin Company, Ltd.,
Chesterfield.

This Company are showing several photographs, among which are many examples of Rateau turbo exhausting plants. The Company hold the licence for the manufacture of turbo exhausters, compressors, boosters, and blowers, and have now supplied over 320 to gas-works, coke-oven installations, &c. They are now supplying in this country a high-speed turbo exhauster, designed on the Rateau principle, for speeds up to 10,000 r.p.m., and are showing a star type impeller for this kind of machine. The Company are also makers of rotary exhausters for gas-works and many other industrial purposes; they have been making these for 75 years and have supplied them to all parts of the world, the total number being upwards of 7000. Models are exhibited on the stand of the two-blade and three-blade exhausters. They are showing a specially designed high-speed rotary machine of the multi-blade type which can be used as a blower, exhauster, or compressor for air or gas. It is being made in various sizes up to 30,000 c.ft. per hour and for pressures up to 5 lbs. per sq. in. The Company have applied for a patent for this machine.

Another specialty is gas valves, which they have been making for over eighty years. Models are exhibited of high and medium pressure double-faced valves, the well-known single-faced rack and pinion valve, worm and rack valve, and also a disc valve for use with purifiers. Special mention may be made of their high-pressure double-faced valves, one of which is exhibited with part of the body cut away to show the internal working of the valve. These valves are made to withstand pressures up to 100 lbs. per sq. in. They are so designed that the bonnet can be removed and a new nut or spindle fitted while the valve is under pressure. A photograph is shown of a 48-in. diaphragm gas governor at the Nechells Works of the Birmingham Gas Department. This is stated to be the largest of its kind in use in this country. There is also a photograph of an installation of special Reynolds' high-pressure district governors at Kings Norton, which are reducing the gas pressure from 15 lbs. per sq. in. to the normal supply pressure. A model of this type of governor is being shown. Photographs are shown also of other types of gas governors and regulators, of which many thousands have been supplied for district and service work.

The firm are also exhibiting various types of gas pressure regulators for gas services, meters, stoves, geysers, radiators, &c., an improved type lubricator for gas exhausters and gas and air blowers, and an oil sprayer for the removal of naphthalene deposits in gas mains.



High-Speed Blower by the Bryan Donkin Co., Ltd.

In addition, the firm are showing, on an outside stand, a new design of high-pressure gas compressor, compressing coal gas up to 5000 lbs. per sq. in. for filling specially made steel cylinders with gas at a pressure of 3000 lbs. per sq. in. on a gas-driven motor 'bus which is being demonstrated in the Fair grounds. The 'bus is also fitted with the firm's special design of governor which will reduce pressures of 30 to 3000 lbs. per sq. in. to a vacuum of 1½ in. water gauge.

Economic Gas Boiler Company, Ltd.,
Junction Mills, Burnley.

In accordance with this firm's usual practice they have still further extended their range of gas boilers. There are a wide variety to be seen, incorporating all the newest requirements of modern domestic appliances. The " Economic " washing machine is a prominent feature, upon which many marked improvements have been made.

These include a new draw-off tap, known as the " Economic," for which the patent is already applied for. Demonstrations of this tap along with the ordinary tap are being given throughout the greater part of the day.

Economic Household Appliance Company, Ltd.,
Queen Anne Road, London, E. 9.

This firm are showing on their stand examples of their gas kitcheners, combined gas fire and cooker, gas radiators, and gas lighters using small electric batteries.

Emscote Foundry Company, Ltd.,
Warwick.

This firm are showing a full range of Emscote gas fires in many new designs and sizes. They also have on view a full range of vitreous enamel cookers of the ordinary open

burner types as far as the oven is concerned, and also a full range of the " Progress " cookers, in which are incorporated the patented radiant heat oven. This oven is claimed to be the only one of its type that is at the present time on the market, and it has given complete satisfaction. A range of vitreous enamel cookers is shown in various colours. In addition to these items, a new type of coke boiler which is believed to be of interest to gas undertakings is exhibited.

Evered & Co., Ltd.,
Surrey Works, Smethwick.

This firm's exhibit includes a large and varied range of lighting fittings—ventilating lamps, pendants, brackets, &c., brasswork of every description for the Gas Industry, and the following specialities.

" Evered's " patented " Simplex " distance control is of the pressure type and is small and neat. It is extremely simple in construction, with working parts reduced to a minimum, ensuring easy and trouble-free working. The whole interior is instantly accessible for cleaning by unscrewing the cover cap. It is made from hot brass pressings.

Evered's "Howie" Burner.

The " Howie " patent burner is of the dome type, specially designed to prevent the rapid discoloration of ceilings and fittings. Also shown are G.L.C. governors, manufactured under licence, and oversink water heater fittings—a neat installation for water heaters, and easily and quickly fitted, and eliminating unsightly " wiped " joints.

Sidney Flavel & Co., Ltd.,
Leamington.

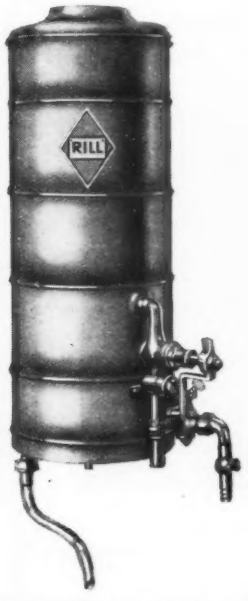
An excellent display of modern domestic gas appliances is shown by Sidney Flavel & Co., Ltd.

Several new models are added to the range of Flavel gas cookers, giving a wide choice. The " Metro " coke fire and the " Metro-Log " gas fire are shown in operation. The Leamington units are of special interest, as they consist of a coke fire, and two types of gas fires, which are made to fit existing grates without structural alterations, and are interchangeable to suit seasonal requirements. A new type of gas radiator is shown, also a portable heater with a low gas consumption.

The " Patriot " boiler for use with gas or coke is included in the exhibits. It provides central heating and hot water supply for the large or small building.

Fletcher, Russell, & Co., Ltd. (Radiation Ltd., Proprietors),
Warrington.

The new water heater which Fletcher's have called the " Rill " has been developed by them recently, and particulars of this appliance will be of general interest. It is of the instantaneous type, with well-designed gas and water taps made to interlock for safety in use. A useful addition to this heater is the water valve, by means of which adjustment may be made to accommodate the various pressures of water. The " Rill " will raise the temperature of the water 42° from cold, at the rate of three-quarters of a gallon per minute, which is quite a useful performance for a heater of this type. In appearance it is up to the usual Fletcher standard, all fittings being chromium-plated. A very simple provision is made for fixing the heater to the wall, while doing away with the necessity for any supporting shelf.



Fletcher Russell's "Rill" Water Heater.

Fletcher Russell's "Celerity No. 4."

Foster Instrument Company, Letchworth, Herts.

This firm have increased the size of their stand by 50% this year, and are exhibiting a wide collection of electrical temperature measuring equipment, in addition to demonstrating various types of automatic temperature controllers on gas, oil, and electrically heated furnaces in other parts of the Fair. Gas engineers should make a point of testing the latest Foster " lamp-bridge unit " optical pyrometer, which, while operating on the same principle as previously, incorporates a number of minor improvements, all of which tend to make for extreme reliability and convenience in use. This type of instrument is valuable for the measurement of retort temperatures.

On the stand of Messrs. Lucas Furnaces, Ltd., a Foster controller is demonstrated in conjunction with a natural-draught gas furnace, both the gas supply and the damper being under automatic control. The motor-driven units are separately adjustable, but operated simultaneously from the one indicating pyrometer. Similar units are available by which the air and gas supplies for forced-draught furnaces can both be controlled automatically to maintain any desired temperature, the arrangement of the valves being such that any required gas/air ratio can be obtained.

Foster & Pullen, Ltd.,
Avil Works, Crossley Hall, Bradford.

This firm are exhibiting selections from their extensive indoor and public lighting specialties, notably their " strip " lanterns in various styles and sizes, many of

which figured prominently in floodlighting scenes in St. James's Park and throughout the country last summer. They also show two novelties in the shape of spot lamps, one of which makes specially prominent figures of policemen on point duty and the other of which with its upward as well as horizontal beam, being by way of a variation of their strip lantern, is applicable alike for the rendering prominent of point duty men as well as numerous other more extended purposes. A catalytic device is shown on their stand for attaching to the controllers of street lanterns, doing away, it is claimed, with the whole system of by-passes, thereby effecting great economies.

The firm have re-designed their inverted and **U** bracket lanterns.

Gas Industry Information Bureau.

The central information bureau, provided by the British Commercial Gas Association and members of the Heavy Section of the Society of British Gas Industries, has already proved its value at previous Fairs. It was designed by Mr. H. Austen Hall, consulting architect to the British Commercial Gas Association, and has been re-decorated to conform with the red and cream colour scheme of the Gas Section. Expert salesmen, lent by the Gas Undertakings, are on duty to answer visitors' inquiries and to supply information and statistics on every domestic or industrial problem connected with gas. Two lounges with easy chairs allow visitors to discuss problems in comfort, and a set of photographs enables the business man to get a rapid survey of the activities of the Gas Industry.

Among the appliances displayed are a gas-operated refrigerator and a meter shown under glass. A fountain of steaming hot water falling from a height into a series of tiled troughs is heated by two multi-point gas water heaters, and arouses the interest of the public. Various makes of gas fire are used to warm the interior rooms of the bureau, and some " plug-in " portable appliances are also on view.

In addition to the British Commercial Gas Association, the contributing members of the Society of British Gas Industries (Heavy Section) are:

Aldridge & Ranken, Ltd.
Broadhead Constructions, Ltd.
Bryan Donkin Co., Ltd.
Chemical Engineering & Wilton's Patent Furnace Company, Ltd.
Clapham Bros., Ltd.
Clayton, Son, & Co., Ltd.
Samuel Cutler & Sons, Ltd.
Robert Dempster & Sons, Ltd.
R. & J. Dempster, Ltd.
Derbyshire Silica Firebrick Company, Ltd
Drakes Ltd.
Firth Blakeley, Sons, & Co., Ltd.
Gas Chambers & Coke Ovens, Ltd.
Goodall, Clayton, & Co., Ltd.
W. C. Holmes & Co., Ltd.
Meltham Silica Firebrick Company, Ltd.
Mobberley & Perry, Ltd.
Newton Chambers & Co., Ltd.
Oughtibridge Silica Firebrick Company, Ltd.
Oxley Engineering Company, Ltd.
E. J. & J. Pearson, Ltd.
Stanton Ironworks Company, Ltd.
Stewarts & Lloyds, Ltd.
F. C. Sugden & Co., Ltd.
Joseph Taylor (Saturators), Ltd.
Thomas Vale & Sons, Ltd.
George Waller & Co., Ltd
West's Gas Improvement Company, Ltd.
Whessoe Foundry and Engineering Company, Ltd.
Willey & Co., Ltd.
Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd.

General Gas Appliances, Ltd.,
Guide Bridge, Manchester.

The stand is divided into three sections—viz., water heating, cooking, and warming apparatus, thus enabling the various appliances to be shown to the best advantage.

In the hot water section a range of apparatus is offered. The General " Immersion " indirect water heater is shown in three forms—a unit for connecting to existing cylinders, a complete thermal storage heater, and the combination set. The latter was introduced at the 1932 Fair and has met with gratifying popularity during the last year. Great progress has been made in the design of General wall type or sink heaters. While no alteration has taken place in the working principle, the entire design and appearance has been improved. These heaters are supplied either single or double cased and can be obtained in white, cream, green, or wood finishes, with heavily chromed tops, bottoms, and fittings. Every effort has been made to prove the merits of General hot water apparatus by means of working and sectional models.

" Governor-General " gas cookers with single burner and automatically controlled ovens are offered in various sizes and can be supplied with either tiled or willow pattern exterior enamels. A useful addition to the " Governor-General " series is the " Deputy "—an extra wide cooker, but of medium height and on high legs. In the double burner oven class special attention is called to the " Villa " and " Easy-General " cookers. The latter can be supplied with either white tiled or cast sides and is an ideal cooker for the small corner in kitchen or flat. Two cookers of the larger type are introduced—a double oven cooker with well-designed hotplate, suitable for hotel and similar purposes and a single-oven cooker capable of cooking for large families. General gas cookers are shown in black and white mottle, lilac blue and white mottle, and " New-Art " blue and white self colour porcelain enamel finishes.

The gas fire exhibit consists of a selection from the " Magna " series. All fires are provided with the latest burner construction and regulation. There is a large range of finishes including art metal, oak, mahogany, walnut, and green woods, and in an assortment of colours.

12 D/4

Walter King, Ltd.

New and Enlarged Stand

"GAS JOURNAL"

"GAS SALESMAN"

&c., &c.

Gibbons (Dudley), Ltd.; and Gibbons Bros., Ltd.,
Dibdale Works, Dudley.

The principal exhibit shown by these firms on their stand is a working example of a Dressler muffle furnace for vitreous enamelling, which is fired by Birmingham gas. Actual enamelling is in process, and the muffle, which is of a new type developed during the last twelve months, illustrates both the great saving in firing made possible by its novel features and the growing use of town gas as an industrial fuel.

Messrs. Gibbons Bros., Ltd., also exhibit photographs of contracts carried out during 1932, including illustrations of a further battery of 22 Gibbons-Kogag coke ovens built in the North of England, a new carbonizing plant for the Weymouth Consumers' Gas Company, coke and coal handling plants for various gas-works, and large batteries of furnace equipment for various purposes. These latter illustrate the efforts made by this firm to increase the use of town gas for industrial purposes, and it is interesting to note that they have built furnaces and kilns during 1932 for such varied operations as carbonizing motor car parts,

vitreous enamelling, bright annealing copper, annealing steel files, and firing earthenware pottery, the total gas consumption for the furnaces built during the period exceeding 100 million c.ft. per annum.

Messrs. Gibbons (Dudley), Ltd., exhibit representative examples of their well-known refractories, including sillimanite, carborundum, silica, and highly aluminous blocks, bricks, and special shapes.

George Glover & Co., Ltd.,

Chelsea, London, S.W. 3.

Here may be seen working models demonstrating the efficient lubrication of the valves of large high-capacity meters, the corrector bar principle applied for the perfect synchronization of diaphragm and valve movement, and an entirely new form of unit top work construction for which important advantages are claimed. Each of the above features well repays close consideration, and technical pamphlets are available for subsequent study.

George Glover's "Chelsea Two" Prepayment Meter.

Messrs. George Glover & Co. also make a special display of their "Chelsea Two" meter. The advantages of this prepayment mechanism are now well known, and gas engineers throughout the country recognize that the claims made when first this pioneer meter was introduced, have been amply substantiated. The "Chelsea Two" meter has one slot only which accepts pennies or shillings, and delivers the corresponding value of gas without any further trouble. Its simple price changing attachment ranges from 2s. 2d. to 13s. 10d. per 1000 c.ft. Only one price rate setting is necessary. When the meter is set for 1s., it is also set for 1d.

This stand would be incomplete without the "Ranelagh" prepayment meter, and accordingly Messrs. George Glover & Co. exhibit working models showing its solid construction and excellent mechanical design.

Thomas Glover & Co., Ltd..

Edmonton, London, N. 18.

On the stand of Messrs. Thomas Glover & Co., Ltd., glass cased models of double coin prepayment meters are available for inspection. As previously, this firm are making a feature of film demonstrations illustrating the various processes in the manufacture of meters. As an innovation this year, they are also showing a film which deals in a comprehensive manner with the processes connected with the repairing of gas meters. This film gives a good idea of the organization which has been created to cope with the problem of handling great numbers of meters of all types and sizes in an efficient and expeditious manner. The film is very complete, showing, first, the course of the meter from the time it is collected from the gas-works, and transported by lorry, until it arrives at the meter works, where all details of its description and index reading are carefully recorded. From this point the details of the actual repair work are faithfully recorded by the camera, and the audience may view all the operations involved from the time it is opened and examined until it has been thoroughly overhauled, re-assembled, and officially tested.

Grant & West, Ltd.,

17, South Street, London, E.C. 2,

This firm are exhibiting the following products: "Selek" metal-to-metal jointing material in powder form, which in practice forms a non-oxidizing, non-rusting joint, guaranteed to make tight, and keep tight, joints under the most exacting jointing conditions, such as steam, super-heat, water, gas, alcohol, spirits, chemicals, &c., and to remain unaffected by condensation or dampness of any kind. "Massa" jointing compound, a new product produced by this Company, is supplied ready mixed for use, and, having a manganese base, is a very strong all-round jointing for use in gas-works, &c., and it is largely used by many of the largest gas undertakings in the country.

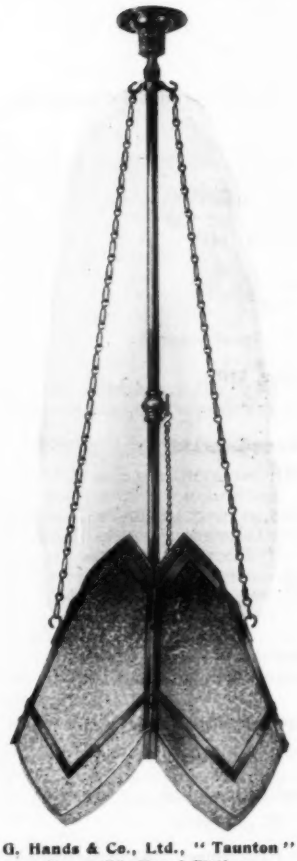
"Cement A" is a powder jointing, having a litharge base. "Cement A" sets hard, will not break up under vibration, "makes up" well, and is clean to handle. "Plastiloy" is a plastic, metallic packing, having the advantage that it is a one-size packing, for all-sized rods and glands. It is anti-frictional, self-lubricating, and the anti-frictional metal in its composition is claimed to have a higher melting point than any other known metal yet produced.

This firm are also exhibiting in the General Section, and here is to be seen their "Belfo" British-made belt treatment, for the treatment of all forms of belting, including leather, hair, balata, cotton, composition, link, &c. It is a belt food, distinct and apart from a belt dressing, and while making the belt slip-proof, at the same time feeds and preserves the belt, improving its life, and rendering it impervious to the destructive action of workshop conditions.

"Cretex" roofing compound represents the latest development in plastic roofing compounds. "Ropres" is a new product, especially designed for the treatment of steel wire ropes and cables, used for haulage and kindred conditions. The effect of "Ropres" is to penetrate right into the heart of the rope, lubricating each individual strand, and rendering the rope water proof, damp-proof, and acid-proof. "Paisol" is a new preparation for removing paint, enamel, varnish, &c. Also shown is the firm's "Revomer" rust solvent, for removing rusted up bolts and nuts.

G. Hands & Co., Ltd.,

67, Farringdon Road, London, E.C. 1.



G. Hands & Co., Ltd., "Taunton" Reversible Panel Fitting.

This firm are exhibiting a complete range of specialities, but the newest features in lighting fittings are the "Taunton" panel fittings. These are particularly attractive fittings at most reasonable prices. The particular feature is their reversibility.

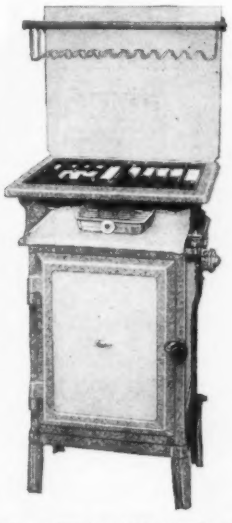
This Company have been appointed sole selling agents for the "Mermaid" water heaters and other "Mermaid" productions — viz., gas kettles, gas-heated towel rails, gas fire screens, and pedestal heaters, a full range of which is shown on their stand.

John Harper & Co., Ltd.,

Albion Works, Willenhall.

Among this firm's general range of gas fires and cookers the following are exhibited: An entirely new model cooker with one burner, bottom-flue outlet oven. This cooker has

been designed with the object of giving the greatest ease in cleaning, both inside the oven and on the hotplate. The absence of projections in the oven gives the maximum cooking space for its size. The cooker is lined with cellular asbestos sheets, giving great insulation, and after a long period of use, the oven can be very quickly taken to pieces



The "Rex" Cooker by John Harper & Co., Ltd.

for overhaul by undoing four screws and two bolts only. The oven gates and shelves are in one piece, and, therefore, easily cleaned. The hotplate bars are in two sections only, right and left hand, which are reversible. The hotplate is fitted with chromium-plated taps, spring loaded. The cooker is supplied with or without thermostat, and is highly finished in grey motile and white enamel, and can also be supplied in coloured enamels to order.

A gas iron is also shown with the top fitted with a heat indicator, which has a pointer showing the correct temperatures at which different materials should be ironed. The gas can be turned down to keep the needle at the temperature required.

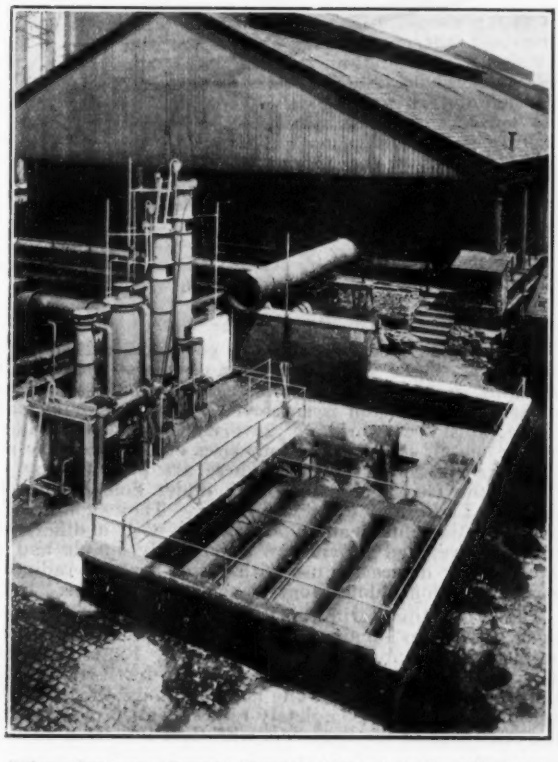
A portable gas fire is exhibited with a one-piece radiant, closely resembling in appearance an electric fire. These are finished in attractive coloured porcelain enamels. Inset gas fires, with and without canopy frames, are also shown.

W. C. Holmes & Co., Ltd.,

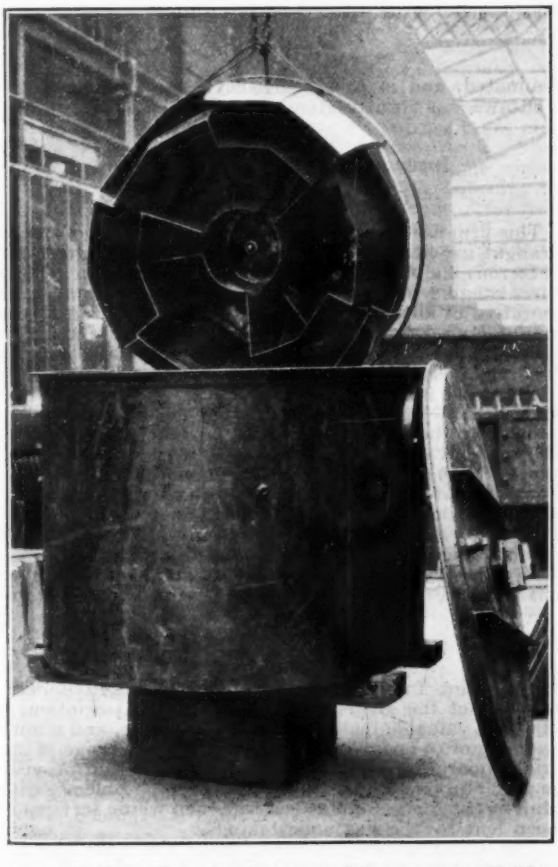
Whitestone Iron Works and Turnbridge Foundry, Huddersfield.

This firm have altered the form of their stand somewhat compared with recent years, and it is actually in the form of a reception room, where their friends may expect to find the firm's principals and representatives. The stand is equipped with models and drawings in connection with their various special plant and processes.

The firm have found from previous experience that engineers visiting the Exhibition most appreciate facilities for having first-hand information on those sections of the Gas Industry of which Messrs. Holmes have special knowledge, and it is expected that interest on this occasion will centre chiefly on benzole recovery, gas drying, various economical means of ammonia recovery and disposal, gas metering, exhausting, boosting, also high-pressure distribution, and measurement of gas sold for industrial purposes. On all these subjects they have recently made developments. An innovation which they are trying out this year is some illustrations of plant done on special linen which is illuminated from behind by gas lighting. They have two panels of photographs on each side of the office doorway, and also a large photograph at each end of the office, so displayed.



Holmes Continuous Benzole Recovery Plant at the Rochdale Road Gas-Works, Manchester.



Patent B-M Gas Meter for the Industrial Consumer, Supplied by W. C. Holmes & Co., Ltd., to the New Leeds Civic Buildings.

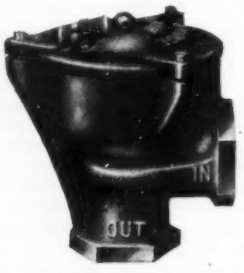
Horstmann Gear Company, Ltd.,

Newbridge Works, Bath.

The Horstmann Gear Company, Ltd., are exhibiting a full range of the products manufactured at Newbridge Works, including the type 3A/UNI controller, which has been standardized by many of the principal public lighting authorities. Type 15/3A for suspension lamps and certain types of upright harp lamps is also a very popular pattern. A type which will create considerable interest is

the latest controller with electro-catalytic ignition that has recently been considerably modified and improved.

The well-known " Newbridge " gas switch is exhibited in many variations, including surface and sunk type hand controls, with by-pass or electro-catalytic ignition. " Newbridge " switches are now available for gas fire control. A special form of electro-catalytic ignition is employed



Newbridge Pressure Governor.

which will provide instant ignition of the burners, while at the same time the ignition element is situated away from the heat one, and is therefore indestructible.

G.L.C. Safety Cut-Off.

" Newbridge " service pressure governors are shown in two sizes. These governors do not employ leather diaphragms or mercury seals, instead of which an oil immersed control piston is employed. All the moving parts of the latest " Newbridge " governors are made of incorrodible metal. A range of four sizes of G.L.C. safety cut-off valves is being shown. These are produced by the Horstmann Gear Company, Ltd., under Sole Licence for the Gas Light and Coke Company. They comprise a thermostatic pilot head in association with a differential cut-off valve, and provide an exceedingly simple and reliable safety device for use with water heaters, radiators, and similar continuously-operating gas appliances.

The firm's time-tariff controller is bound to create considerable interest among engineers who are faced with the problem of the unprofitable gas consumer. Examples of this device were shown at the meeting of the Institution of Gas Engineers in London in June last, but since that time the apparatus has been completely re-designed to overcome all the criticisms of the engineers who then inspected them.

" Hurry " Water Heater Company,

39, Broad Street, Birmingham.

The " Hurry " Water Heater Company are exhibiting a full range of their gas water heating appliances. More space has been taken this year to permit the display of new features which are of interest. A full range of wash-boilers in various designs and finishes are to be seen, and there are also working exhibits of the firm's patented dual-purpose bath attachment wash boilers, which have been installed in housing schemes throughout the country.

Working exhibits of the different types of circulators manufactured by the " Hurry " Water Heater Company attract attention, and these circulators have gained a wide popularity among gas undertakings, plumbers, and speculative builders, because they are easily fitted and give good service.

The " Ottawa " thermal storage heater is a new product of the firm which is exhibited. This heater comprises a storage tank, which is lagged, and a heating unit. The principle on which it is constructed is novel. Condensation, the " bugbear " of this type of heater, has been

The "Hurry" Water Heater Company's "Ottawa" Storage Heater.

eliminated, and in price, efficiency, and running cost the " Ottawa " is an attractive proposition.

Incandescent Heat Company, Ltd.,

Cornwall Road, Smethwick.

This firm are showing a comprehensive range of natural-draught gas-fired furnaces suitable for the heat treatment of ferrous and non-ferrous metals, alloys, &c., for temperatures ranging from 1000° to 1400° C., and which are representative of all the small types of town gas fired furnaces manufactured by the firm. They also manufacture furnaces for all purposes, heated by oil, producer gas, solid fuel, and electricity.

On Stand 9 K they are showing a collection of articles and metals—the products of some of their customers—which have been heat treated in their furnaces. Owing to the space available they are only able to show the smaller types of furnaces manufactured; the photographs exhibited, however, give some indication of the larger plant which they have installed in many important works in this country. They have installed a number of plants for the glass and ceramic industries, and, for the convenience of prospective clients, they have separate leaflets dealing with various industries, which are procurable at both of the stands.

Joint Industrial Exhibit.

The Joint Industrial Gas Exhibit, arranged under the auspices of the British Commercial Gas Association, is a new and valuable feature of this year's Fair, and a notable example of co-operative enterprise. A wide range of industrial apparatus is on show for the inspection of visiting manufacturers, who can discuss their problems with a staff of experienced industrial salesmen whose services have been lent by the gas undertakings.

The stand occupies a conspicuous site near the North entrance, next to the stand of the Birmingham Industrial Laboratories. The exhibits are fixed round three sides, with concrete tables carrying smaller apparatus in the

centre, and an office, which may be used for consultation, at the other side.

Below we give a list of the exhibits, with a brief description of each.

(1) *Natural Draught Gas-Heated Oven Furnace* made by Messrs. Lucas Furnaces, Ltd., Birmingham. This furnace has hearth dimensions 24 in. back to front, 18 in. wide, 12 in. high, and is constructed of a high-quality firebrick with insulation in a cast-iron casing. It is heated by a series of burners operating with gas at the usual town pressures. The furnace is representative of several designs and makes which are used in very large numbers for the heat-treatment of steel and non-ferrous metals, including carburizing, normalizing, annealing, and hardening-out operations.

(2) *Oven Furnace* made by Messrs. British Furnaces, Ltd., known as the A.20, operating with gas at ordinary town pressures and air at a pressure of about 1 lb. per sq. in. through a proportioning device, the whole system of heating operating on the surface combustion principle by the projection of the flame on to a broken refractory bed, the work to be heated being carried out both by radiation and by contact with the products of combustion. This furnace is suitable for general works heat-treatment operations requiring temperatures up to 1000° C., and burner equipment may be suitably arranged for high-speed steel temperatures to be obtained if required.

(3) *Conversion Burner Set* for use with central heating boilers of the solid fuel type, for the conversion of same from solid fuel to gas heating.

(4) *Small Lead Lined Tank* with tubular heater and low-pressure gas burners. This is shown as an example of a system of gas heating which has been found to be adaptable and very suitable for the heating of the lead-lined wooden tanks so extensively used in plating shops, where the temperature of the acid baths has to be raised to meet the general production demands.

(5) *Bakelite Moulding Press.*—This press is made by Messrs. Geo. Finney & Co., of Birmingham, and is equipped with gas burners, including rails and injectors, by the Birmingham Gas Department, which are shown as being what are considered the latest type of low-pressure gas heating equipment for Bakelite moulding presses. This press is thermostatically controlled by the new design of low-temperature controller by the Cambridge Instrument Company.

(6) *Special Furnace* for the heating of billets for the hot stamping process. This furnace was specially constructed by the Birmingham Gas Department, and embodies several novel features. The combustion of the gas and air mixture from the burner takes place in a small chamber which is situated over the working hearth of the furnace; thus direct flame contact with the work to be heated is avoided, lessening the risk of melting, as a considerable amount of the heating operation is carried out by radiation.

(7) *Samples of Low-Pressure Gas-Heated Soldering Iron Stoves,* self-heated soldering irons, and a representative collection of several types and makes of burners used in general industrial heating operations.

(8) *A Positive Pressure Blower* by Messrs. Keith & Blackman Co., Ltd., is at work supplying the necessary air required by the gas and air blast furnaces shown on the stand.

(Nos. 1-8 are supplied through the City of Birmingham Gas Department. They are demonstrated under fire, and the furnaces are fitted or demonstrated with suitable pyrometer apparatus by the Cambridge Instrument Company, the Foster Instrument Company, and other instrument makers.)

(9) *The Sheffield Gas and Air Blast Forge Furnace.*—This type of furnace is very popular for rapid heating for forge and steel articles of many kinds. The combustion system known as gas and air blast requires the use of town gas at ordinary pressure of less than 6 in. W.G. and air at a pressure of at least 1 lb. per sq. in. The pressure air by virtue of its velocity induces the gas to flow, and as both air and gas are under separate valve control, high combustion efficiency can be obtained. The rise in temperature of the furnace is rapid owing to the efficient combustion system used, and as a pressure exists in the furnace scaling by excess air can be reduced to a minimum. The possibility of use of excess gas with this system of combustion eliminates the scale formation due to flow of air. (Sheffield Gas Company.)

(10) *Four Sizes of Blowpipes.*—Makers, Fletcher Russell & Co., Ltd. The usual type of blowpipes with gas and air controls.

(11) *Small Crucible Furnace* (3 in. dia. crucible).—Makers, Fletcher Russell & Co., Ltd.

(12) *G.L.C. "A" Type Muffle Furnace.*—Makers, Baird and Tatlock, Ltd. A small muffle furnace for laboratory work. This is one of a range of similar furnaces and is notable for its neat appearance and high efficiency. In both these aspects it represents a radical change from older practice. An atmospheric burner with fireclay nozzles below the muffle is supplied through a governor. The furnace is insulated with special low-capacity brick and encased entirely in aluminium. A Siemens thermocouple and pyrometer are fitted. In use the furnace heats up from cold to 1000° C. in about half-an-hour and is extremely economical.

(13) *G.L.C. Small Soldering Stove.*—Makers, Selas Company, Ltd. Similar in appearance and general construction to the muffle furnace described above, and fitted with a governor. The single heating chamber is in the form of a muffle made of a nickel-chrome heat-resisting alloy and accommodates three small soldering irons side by side. A small hole in the top of the muffle allows some of the products of combustion to sweep through it and remove any vaporized flux or other gas present. Absence of direct flame contact with the bits prevents local overheating and corrosion and ensures clean work of uniform quality. The stove is very economical in use, having a maximum gas rate of only 4½ c.ft. an hour.

(14) *G.L.C. Large Soldering Stove.*—Makers, Selas Company, Ltd., and A. H. Wilkes. Similar to the small stove but provided with two heating chambers side by side each accommodating one 1¼-in. bit. The maximum gas rate is 12 c.ft. an hour.

(15) *G.L.C. Unit Air Heater.*—Makers, Keith Blackman & Co., Ltd. This is a neat automatic air heater for use in factories and workshops, where it is suspended at a height of 10 or 12 ft. from the floor. An electric fan blows the air through a heater made of stainless steel sheet and heated from below by luminous gas burners contained in a finned aluminium burner box. The heated air does not come in contact with the products of combustion, which are led away by a 5-in. flue fitted with a baffler. Operation is entirely automatic; the draught from the fan turns on the gas, which is lighted by a pilot jet. If the pilot jet has been blown out the gas cannot be turned on. In hot weather the fan may be used by itself without the heater. Adjustable louvres in front of the unit direct the air towards the floor thus ensuring warm moving air for the occupants of the room. The unit may conveniently be operated by a room thermostat. Gas rate, 200 c.ft. an hour.

(16) *Industrial Copper for Works Boiling Processes.*—Makers, Benham & Co., Ltd.

(17) *Small Steam Raising Boiler.*—Makers, Briggs & Co., Ltd. A small vertical boiler for use up to about 50 lbs. per sq. in. pressure and with a capacity of about 30 lbs. of steam per hour. The hot gases pass up vertical tubes through the boiler and are deflected by a baffle at the top. This boiler is very suitable for small jobs owing to its simplicity and easy maintenance.

(18) *Small Melting Furnace.*—Makers, Gas Light and Coke Company; British Furnaces' burner equipment. A single air-blast burner fires tangentially into the vertical cylindrical combustion chamber. The gas supply is governed to atmospheric pressure and is drawn into the air stream at the throat of a Venturi tube. The burner can therefore be entirely controlled by the air valve and the mixture remains constant at all settings. Temperatures up to 1600° C. may be attained with this furnace. Maximum gas rate is 150 c.ft. an hour.

(Nos. 10-18 supplied through the Gas Light and Coke Company.)

(19) *Rivet Heating Furnace.*—This gas-fired rivet heating furnace is specially designed to ensure that rivets can be put in and taken out with the minimum of effort and time. Both the portable and stationary models are lined with the best grade firebrick backed up with ample insulation. A preheating chamber is provided in which the waste gases from the furnace are utilized to preheat the incoming cold rivets. By the use of gas-fired furnaces scaling is reduced, fuel economies are obtained, and rapidity of heating is increased.

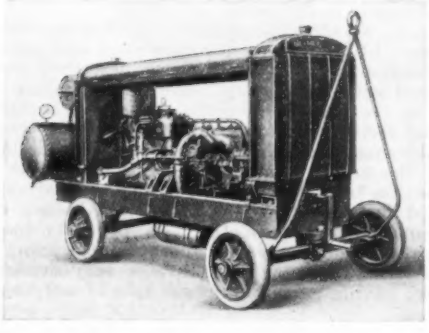
(20) Showcase containing photographs of striking industrial installations (including carburizing furnaces at Sir W. G. Armstrong Whitworth & Co.'s Works) and public service vehicles driven by compressed gas.

(Newcastle-upon-Tyne and Gateshead Gas Co.)

Lead Wool Company, Ltd.,

Snodland, Kent.

This Company are exhibiting pipe jointing materials, including "Lead Wool," lead wire, spun yarn, leaded yarn, bitumenized yarn, together with sample sectionalized joints. A pipe jointed with their patent flexible rubber ring joint is shown under pressure with a flexing arrangement. Caulking tools, both pneumatic and hand and various sizes of main stoppers, together with a model patent joint testing apparatus for large pipes, are displayed.



Lead Wool Company's Portable Air Compressor.

Of particular interest is a portable air compressor, most spare parts of which can be obtained from any Ford dealer throughout the world, together with a complement of pneumatic tools for mainlaying and road work generally.

Steel wool and shavings for cooker cleaning and general domestic and other uses are on show. "Lead wool" pipe joint compound for screwed and flanged pipes, suitable for gas, oil, petrol, and air, are also included in the exhibit.

Lighting Trades, Ltd., and the Welsbach Light Company, Ltd.,

Farringdon Street, London, E.C. 4.

As the pioneer makers of mantles in Great Britain, these companies are able to present a display which should be of interest to everyone connected with the Gas Industry. Among other exhibits, they show a very extensive range of mantles manufactured by them in various kinds of knitting and weaving. These range from the smallest to the largest sizes made—from the microscopic to the 110 mm. diameter used in lighthouses.

A new and very attractive range of panel fittings, with soft toned glassware, and bowl fittings with chromium plated downrods and fitments, provide an attraction to buyers interested in this form of illumination. A feature is made of types of inverted burners, hall lanterns, and fittings which are already popular and well known, and there is also included a new and distinctive pendant with bracket to match for the purpose of candle lighting. Another feature is the "Renown" all-magnesia superheater clusters which are now being extensively used by lighting authorities both for indoor and outdoor lighting.

A new and attractive note in the way of portable gas fires is struck by the Welsbach "Kern-screen" fire. This embodies the well-known "Kern" burner. Although there is no need to introduce the Welsbach "Handiheater," this gas fire is shown at the Fair in a new form which should increase its popularity. Another new gas fire which is worthy of note is the "Alrae" 7-radiant fire. This is made in black, green, grey, and cream enamels. The burner is of special construction, giving the highest heating efficiency per cubic foot of gas consumed. The attention of visitors should be drawn to a new type of flexible tubing, the resilience, strength, and degree of safety of which are exceptional. This is shown with a rubber casing made in a large range of colours with ends to match.

Donald Macpherson & Co., Ltd.,

Knott Mill, Manchester.

The central exhibit on this stand is the firm's well-known Pagoda. In addition, there is a display of finishes in "Foochow" oriental lacquer. This type of industrial finish is very fine, and compares favourably with vitreous enamelling in production costs. One, two, or three coats with only one baking, and a fine finish in a few hours, are among the advantages claimed, while fine pastel shades are now possible in high heat resisting materials. This indicates the pioneer spirit of Messrs. Donald Macpherson & Co., and it is pleasing to note that inquiries are reaching them from all over the world for this product.

R. & A. Main, Ltd.,

Gothic Works, Falkirk.

A visit to the stand of Messrs. R. & A. Main, Ltd., gives a forcible impression of the progressive policy of this firm of makers of gas cooking and heating appliances. The outcome of extensive research and experience here finds practical expression in the many and various designs on view.

Offered as an alternative to the already widely known blue and white "Mainamel" cooker (which can also be seen) the new model in green and cream perhaps attracts most attention in the cooker section. This handsome appliance is also fully enamelled, outside and inside, back and front, and embodies the very latest "Main" improvements, including a new type of stamped enamelled plate rack; stainless taps with bakelite handles; the patent "Conservor" oven which saves gas and bakes perfectly on every shelf; and the red dial "Mainstat" which automatically controls the cooking and prevents the use of too much gas. There are also cookers in mottled and dappled finishes which in design and construction emphasize the high standard of elegance and efficiency to which the modern gas cooker has been brought. A contrast in catering capacity will be found in the heavy cooking apparatus for hotels, restaurants, &c.

"Unistat" Heat Controller, fitted to the "Unimain" Radiator.

Stamped Metal Double Plate Rack for "Deluxe Mainamel" Cookers.

APPARATUS BY R. & A. MAIN, LTD.

Messrs. Main have in recent years applied their research and technical staffs to the task of providing modern and reliable water heaters. The result is demonstrated by the display of a new series of storage water heaters, which have been fully tested, contain many new and unique features, and embrace a range of appliances covering every normal requirement in the provision of hot water for kitchen sinks, cloakrooms, hairdressing saloons, surgeries, bathrooms, &c. These heaters are all automatically controlled by rod-and-tube thermostats, and heat up their contents with a low rated gas consumption and high thermal efficiency.

A comprehensive display of gas fires includes specimens of both inset and upright types, also portable models. An outstanding feature in this section is the "Gloria" fire, which is a notable departure in design, and affords distinct possibilities to the architect or builder in his decorative treatment of the fireplace.

The radiator section includes the well-known "Unimain" model, which has proved its worth in the heating of offices and public buildings, and which ensures a thoroughly efficient and comfortable system of heating, by means of perfect combustion of the gas in properly designed tubes. Its governor burners take care of any variation in local gas pressure, and its automatic control of the heat output prevents overdrying the air. The "Cinemain" radiator for cinemas, &c., embodies the features of the "Unimain," but has a fixed front instead of a hinged door, thus preventing any unauthorized person from interfering with the burners or internal parts of the radiator base. For use where floor space is restricted the "Romain" panel heater is particularly adapted. This heater fixes on the wall and requires no flue. A special safety pattern, for use in garages, or where highly inflammable goods are stored, is also shown. In this special pattern, which meets with Home Office and insurance regulations, a safety locking tap and double gauzes in base and outlet are provided. This renders the heat source doubly protected against petrol fumes or combustible substances of any kind.

Meltham Silica Fire Brick Company, Ltd.,

Meltham, near Huddersfield.

This firm are exhibiting representative samples of their "highly converted" silica bricks and special shapes such as are largely used in the gas, glass, and coke oven industries. They also show, in an attractive form, small built-up sections of the vertical and horizontal retorts, and coke oven bricks. A notable feature is the display of whole-piece sections of silica horizontal retorts. Then, in addition to the above, there are also shown on the stand samples of super-refractories such as magnesite, chrome, and Sillimanite goods, as manufactured by the firm's allied concern, Messrs. Pickford, Holland, & Co., Ltd., of Sheffield.

Metropolitan Gas Meters, Ltd.,

Hyson Green, Nottingham.

This firm are showing a wide range of gas meters of the lights, standard, and high-capacity types, both prepayment and ordinary, and including stop action meters, hotel meters, and ration meters. The prepayment meters are of both the single-coin and the two-coin variety.

Midland Brass Fittings Company,

181, Aston Road, Birmingham.

This progressive firm of many activities invariably show something of unusual interest, and this year prominence has been given to various methods of fixing oversink water heaters. Complete units for both gas and water inlet, and covering most of the various water company's requirements, are on view, from low-price brass or gunmetal to the more expensive chromium-plated article.

A silent gas fire cock is another "Midland" exhibit. It is a plug cock so constructed as to remedy the objectionable "hiss" often set up by a partly turned plug cock. The new "Midland" pattern is stated to pass gas without a sound, with the plug in any position.

Established lines such as the "Rusto" meter filter and the "Silent Knight" burner are again demonstrated. The latter is shown fitted with a novel by-pass arrangement that has evoked much comment.

Moler Products, Ltd.,

42, Kingsway, London, W.C. 2.

A full size section of a Dressler tunnel oven is erected on this firm's stand, complete with trucks, and effective insulation is shown as being composed of a base raft of "Fosalsil" insulating concrete with a lining of "Fosalsil" economite insulating bricks behind the refractory. The cavity between the insulating brick and the common brick exterior wall is filled with "Fosalsil" No. 5 insulating powder with the exceptionally low thermal conductivity figure of 0·57 B.Th.U. per sq. ft. per hour per 1 in. thickness per ° F. Members of the technical staff of Moler Products, Ltd., are continually in attendance, so that any inquiries will receive immediate consideration, and specific information on the most economical methods of effecting insulation will be given and graphically demonstrated.

Further extensions to the firm's model factory at Colchester have enabled them to make considerable improvements to the qualities of their standard products, and the large number of engineers who visited the stand last year has prompted the firm to remain in the Gas Section.

New Geysers (1931), Ltd.,

25 and 27, Addington Square, S.E. 5.

This exhibit includes a full display of gas geysers and water heaters. A special feature is made of porcelain enamelled geysers in several art colours. The firm's increasing demand for geysers in this lasting and labour-saving finish was originally brought about by the introduction of the popular "White Chief" geyser. The firm now offer other porcelain enamelled geysers, including the new "B" pattern "Reliafont." This is for general house supply, and can be offered in numerous finishes, including porcelain enamel. The ideal method of supplying hot water to a number of taps throughout the house is by means of the "Instor," which is a combined geyser and storage heater. The "Mite" geyser for sink, lavatory basin, hairdressing saloons, dental surgeries, &c., can be supplied in many different finishes.

George Orme & Co.,

Oldham.

On this stand is a comprehensive range of wet and dry gas meters, high-capacity meters, prepayment meters, and gas main cocks.

Parkinson Stove Company, Ltd.,

Stechford, Birmingham.

As in previous years, the Parkinson Stove Company, of Birmingham, have arranged a comprehensive display of gas cookers, gas fires, radiators, and water heating apparatus, which embrace many new features of interest to gas engineers.

The exhibits include, among the high-grade enamelled cookers, examples of the "New Suburbia," "Calthorpe," "Newpark," "Liverpool," and others, as well as the "Birma"—a cooker designed more particularly for ownership by gas undertakings. Among the above the "Calthorpe" attracts attention, owing to its many up-to-date features of design.

In the "Birma" cooker, also, the gas engineer will find an appliance of more than usual interest as this cooker has been designed with easily detachable enamelled door and side panels, especially to overcome maintenance difficulties, to facilitate reconditioning, and, at the same time, to enable gas undertakings to provide slot and other consumers with a cooker of modern design.

Examples of the new "Ajusto" oven heat control are found on several cookers. This control has been redesigned to eliminate every possible cause of trouble, and its neatly enclosed dial with only one visible number, and internal removable filter which by preventing the entrance of dust, secures perfect valve action, will appeal to the Gas Industry. A new safety oven tap adopted on the latest cookers is also well worth noting, as it automatically locks itself, and can only be turned "on" by applying pressure to the knob. Typical examples of the small cooker include the well-known "Stechford," and a new compact little cooker of similar size.

Parkinson's "Curvex" Fire and "Calthorpe" Cooker.

Another section of the exhibit comprises examples of the well-known Parkinson gas fires, in attractive finishes, including bronze, silver, and art colours. The "Curvex" fire was designed to secure the advantage of wider distribution of heat, both vertically and sideways, and in which the specially curved radiant surface has proved admirably effective in obtaining this result. The series of "Flatholme" mantel registers and fires introduce an original note, by reason of their modern design and tasteful colour finishes.

New portable and screen type fires are shown, the former of which can be easily carried and used for temporary heating anywhere where a suitable gas point is available, while the latter has been specially designed for use as an occasional heater in front of an ordinary coal range during the summer. A new cabinet heater makes its first appearance, intended more particularly for use where only a limited height is available, as under windows, &c.

One of the oldest branches of the Parkinson business—that of water heating—is represented by a variety of modern apparatus, including "Treasure" geysers in chromite and polished copper finishes, fitted with interlocking taps or safety gas valve; the handy little "Pearl" geysers for use over sinks, &c., and recent examples of the "Gacylette" storage heater, with automatic control, for kitchen and similar use.

W. Parkinson & Co.,

Bell Barn Road, Birmingham.

This firm are making a feature of modern street lighting equipment, including square pattern lanterns with self-contained inverted burners and outside gas and air adjustment, also fitted with upright Swan-neck type burners.

The conversion burners (which are arranged in both cluster and alignment formation) are metallized to prevent corrosion, and this gives a more attractive appearance.

The exhibits include suspension and " U " fixing lamps, embodying the latest improvements, including reflecting devices. A special feature is made of the " Mor-lite " patent directional reflector, which is supplied with an ingenious form of adjustable clip allowing movement on either a vertical or horizontal axis, and enabling the wings to be arranged to give the necessary bias for bends in roads, or to be removed without disturbing the adjustment. This reflector can now be applied to suspension and arc lamps, as well as square lanterns.

Specimen traffic lamps will also be shown, including " danger " lamps for traffic island positions and lamps for illuminating traffic signs; one of the latter is a double-purpose lamp, having a chromium plated reflector with ruby lens inserted, so that it also serves as a danger signal.

The exhibit also includes a comprehensive range of meters, ordinary and prepayment patterns; including their new small high-capacity ordinary and slot meter. Perhaps the outstanding feature is the " Super Two " and " Bi-Coin " prepayment meter to take either pence or shillings, at will. This additional convenience to the gas consumer will no doubt prove attractive to many gas undertakings.

A 10-c.ft. capacity test gasholder of the latest design, made to the specification of the Standards Department of the Board of Trade, is on view. In governing apparatus this firm have a 10 in. pressure-loaded governor fitted with the usual two valve compensating arrangement. This has been modified in design and shows the new aluminium short range valves which allow of a more compact design, and a reduction in inertia of the working parts. The pressure-loading system, by means of an auxiliary pilot governor, permits of greater ease in loading due to the smaller weights required, and also allows of the bell being totally enclosed, thus avoiding any possibility of leakage. The pilot governor can be fixed at a distance from the main governor if required.

A model of a vacuum governor for use in the retort house and designed for simplicity in action with efficient governing is shown. Made on the counter-balance principle all parts are as light as practicable, thus adding to the sensitiveness of the apparatus. The sleeve valve is made of bakelite, and is readily accessible for cleaning. The water feed is arranged to pass through the tank and then to overflow into the bottom valve chamber. A liquor overflow and tar drain are provided. This governor can be made for either weight or pressure-loading. There are also exhibited single tube gauges, compound gauges, for either pressure or vacuum, double limb gauges of varying patterns, thermometers, &c., and a test meter of the " Hyde " pattern for use with calorimeters.

A secondary index on view is adaptable in conjunction with the ordinary consumer's meter, for use when the price of gas is varied during the twenty-four hours, and for special contracts, such as guaranteed minimum consumption.

Pipe Protection Co., Ltd.,

Waterton Works, Mossley.

This firm exhibit anti-corrosive and anti-electrolitic pipe coverings known as " Parafilm " and " Bulldog " swathe, in addition to a machine to show the wrapping of pipes by mechanical means.

" Parafilm " has been proved by practical tests over an extended period, to render all classes of pipes immune from corrosive and electrolitic action. It is composed of a paraffin wax amalgam made up in the form of ribbon, varying in width according to the diameter of pipe to be covered. Its adhesive qualities under slight tension enable it to cling to the surface of the pipe, and it possesses sufficient elasticity to negotiate easily, bends, tees, elbows, &c., making a neat close-fitting job. The amalgam is stated to be unaffected by time or weather or any class of soil, does not harden or crack but always keeps its pliable nature. It is easily applied, the pipe requiring no special preparation, all that is necessary being simply to wrap the ribbon round the pipe, keeping a slight tension on the ribbon.

Power-Gas Corporation, Ltd.,

Stockton-on-Tees.

The Power-Gas Corporation, Ltd., are exhibiting a sectional model of their completely automatic carburetted water gas plant. The model gives a very clear idea of the internal and external arrangements of the plant and the means adopted for automatic and continuous charging, automatic control, self clinkering, self-steaming, self-cleaning, and labour saving in ash handling. It includes their dry bottom generator and every essential part up to the wash-box or the chimney, and makes a special feature of the ignition arch carburettor recently introduced with such success by their Associates in America, the Semet Solvay Corporation, Ltd.

One of the advantages of this carburetting system is its adaptability for gas or heavy fuel oils in combination with the back-run and gas oil with forward runs, rendering it suitable for dealing with the available materials, economic price, and other conditions likely to be met with at home or abroad. All the main features of the plant are fully protected by patents.

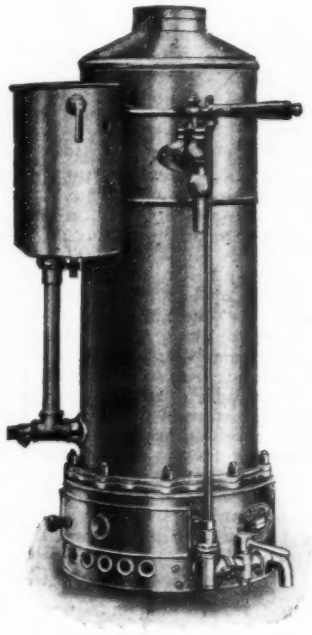
A typical sample of coke breeze which is being gasified successfully in the Koller type of producer is shown, and operating results are available. Of this fuel, no less than 70% passes a ¼-in. mesh.

Radiation Ltd.,

Birmingham and London.

This year's Radiation stand at the British Industries Fair, Castle Bromwich, is an object lesson in water heating by gas, and shows the high state of perfection to which this class of apparatus has been brought, through constant development, by Radiation Ltd.

The entire exterior of this finely designed stand has been given over to displaying the various hot water appliances made by Radiation Ltd., in actual use and also in section for demonstration purposes. These sectional models show every technical detail and explain the working principle of each piece of apparatus. Still further interest is added by a unique series of illuminated diagrams over the various appliances, showing in simple outline the construction of the heaters, piping layouts, &c. Altogether, this is a display of very considerable interest, and demonstrates the strong position gas has attained in the provision of domestic hot water supply.



Radiation " Perfectea " Boiler.

The Radiation " New World " gas cookers with " Regulo " oven heat control are also featured in the stand, and particular attention will be given to the beautiful range of coloured porcelain enamelled finishes of various combinations. The boon of chromium-plating of bright parts which is obtainable either in conjunction with the colour finishes or with the mottled-grey porcelain enamel, will also be appreciated, making the appliance a simple proposition to keep clean.

Radiation gas fires with " Beam " radiants continue to increase in popularity with the public, owing to the soft and penetrating nature of the warmth emitted, which is considered by independent observers to be highly beneficial. These fires are supplied in a wide variety of designs and also in colour finishes to meet the modern trend in home decoration.

[The exhibits of the constituent firms of Radiation Ltd. are described separately.]

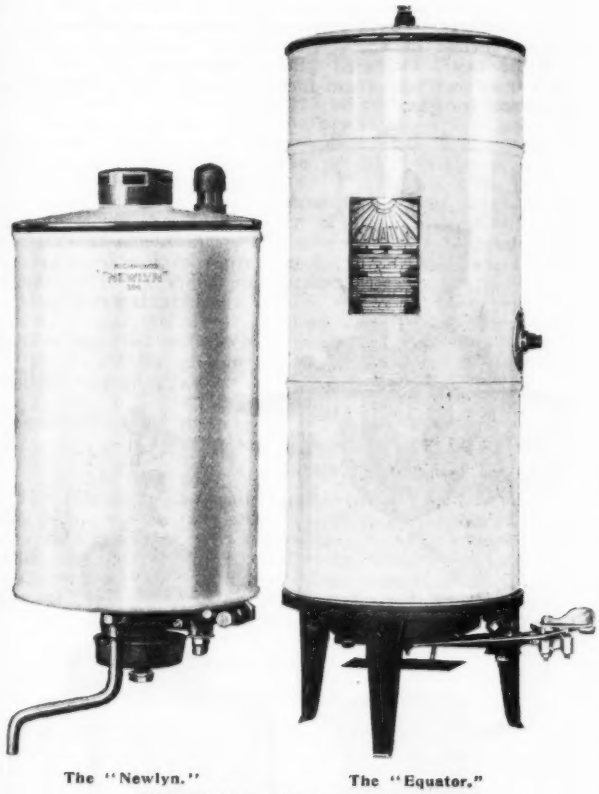
Richmonds Gas Stove Company, Ltd. (Radiation Ltd., Proprietors),

London and Warrington.

Prominent among recent introductions are the new pattern " Newlyn " and " Lynton " sink heaters (Patents applied for, Registered Design, 773747) which were launched in June last. Manufactured with engineering precision and embodying every provision for long and trouble-free life, these two heaters have acquired widespread and well-deserved popularity. Chief among the new features introduced with these heaters are:

1. The gas and water inlets and the thermostat valve are so placed as to be all accessible from the front of the heater. A further striking development is the facility for removing the thermostat valve for inspection and cleaning, without interfering with the temperature adjustment.

2. The cold water feed has been designed on a new principle. Instead of being carried upwards, along the outside of the heater, to a filler cup at the top, the feed now runs through the interior of the heater direct to a new water-feed cap (made of non-corrosive material), where it is released in a visible stream which is directed into the base of the heater. This arrangement greatly improves the general appearance of these heaters, by the elimination of external water pipes.



The "Newlyn." The "Equator."

RICHMOND'S WATER HEATERS.

3. The solid-drawn combustion tube which now extends through the lid of the heater effectively prevents products of combustion from entering the water chamber. The top of the combustion tube has been fitted with a new type of ventilating cap made of non-corrosive material.

4. Special means have been devised which not only prevent loss of water by evaporation, but also serve to insulate the top of the heater.

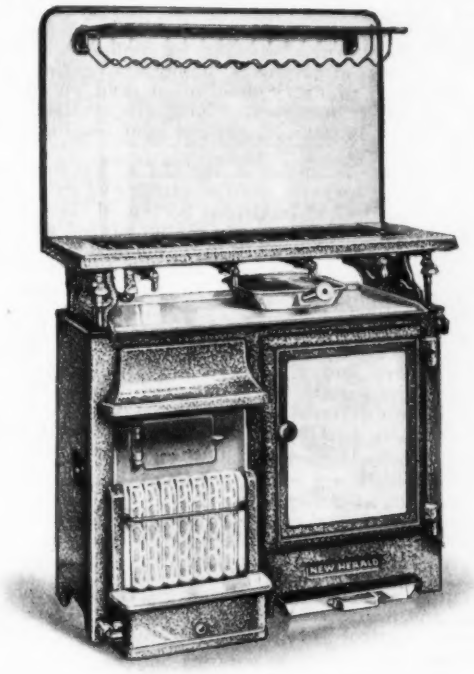
The " Newlyn," which is the insulated heater, has the advantage of being in white porcelain enamelled finish, while, as an alternative, an all-chromium plated model is also available. The " Lynton " is now supplied in three finishes—namely, cream cellulose enamel, gunmetal, and chromium.

The " Equator " thermal storage water heater (Patent No. 183048) formerly available in 12 and 25 gallon capacity sizes, has now an added size with an 18-gallon storage. The great feature of the " Equator " is the speed with which it works. It is ready for use within ten minutes of first lighting the gas, when supplies of steaming hot water, sufficient for general domestic requirements, may be drawn off at scullery sink and wash basin. The 12-gallon " Equator " will provide for two hot baths per hour. The 18-gallon size also supplies two hot baths every hour, but this size has been specially made to meet the requirements of an additional wash basin or a larger (deeper) bath.

R. Russell & Sons, Ltd.,

Peel Foundry, Derby.

In addition to the " New Herald " gas oven, patent " Herald " greenhouse and garage heater, and " Waverley " gas mantle this firm are also exhibiting a very much improved model of their " New Herald " gas combination.



"New Herald" Gas Combination by Messrs. R. Russell & Sons, Ltd.

Since exhibited the first time, at last year's Fair, various important improvements have been effected, particularly in connection with the hot plate, which has a narrower cornice, heavier grid sections, and a reversible grill burner, while all the burners are of higher efficiency. A seven-radiant fire has been fitted as a standard instead of the eight-radiant fire, and altogether the 1933 model is a considerable advance on that exhibited last year.

Sawer & Purves,

Miles Platting, Manchester.

Exhibited on this stand are consumers' meters in glass and tinplate cases, also various sizes of meters and meter parts. This firm's prepayment meter with two-coin attachment is shown, as is also their patent diaphragm. This diaphragm, which is now widely used, has a covering of oiled silk, enabling the leather to retain the lubricating oils, preventing the " drying-up " of the leather, and prolonging the life of the diaphragm. A model coin collecting van is shown which, it is claimed, is a boon to slot meter collectors. Pressure gauges, main taps, and brasswork of all kinds made by the firm are demonstrated, as is also a model test holder.

Selas Gas and Engineering Company, Ltd.,

City Road, Manchester.

The Selas Gas and Engineering Company, Ltd., are de signers and manufacturers of a comprehensive range of products for the efficient and economical use of gas for industrial heating purposes and processes of all descriptions. They supply plant and equipment for all industrial gas combustion systems, as follows: Pre-mixed gas-and-air system (partial air-gas mixtures), pre-mixed gas-and-air system (total air-gas mixtures), high-pressure gas, low-pressure gas and pressure air, low-pressure gas with natural draught, and luminous flame firing and heating systems.

Among the exhibits on their stand is an example of their patent industrial gas system for controlled partial air-gas mixtures. The plant comprises automatic gas and air mixing apparatus, giving automatic and synchronized control of every factor relating to, connected with, or bearing

upon the ultimate result at the burner. Complete control of both initial and final air-gas volumes, ratios, and pressures is secured with mathematical precision at all demands and under all conditions. The scientific mixing and mechanical diffusion of gas with air enables the maximum quantity of utilizable heat to be developed from the potential heat units in the gas. This, together with the unique burner applications that the use of the system permits, leads to greatly improved results and an appreciable economy in gas on the basis of equal work performed as compared with all other methods of gas combustion. The apparatus is suitable for at least 90% of industrial heating purposes and processes, notably for the firing of industrial furnaces of all kinds, conveyor and stationary ovens and stoves, for burners working in confined combustion chambers or inert atmospheres, immersion heating, direct-flame operations of every description, and an unlimited number of other purposes. Nine are available, in all capacities up to 10,000 c.ft. gas per hour (exclusive of all air in the mixture).

Also shown are examples of the G.L.C. gas-fired muffle furnaces. These furnaces are the outcome of extensive research and tests by the Industrial Section of the Gas Light and Coke Company. They are manufactured and distributed under licence, and are very efficient furnaces for laboratory and commercial uses, and suitable for all working temperatures up to 1250° C. The gas consumption with all sizes is extremely low. They are suitable for laboratory and experimental work, testing of materials at high temperatures, assaying, metal heat treatments, firing of enamel, pottery and glass, and analytical work. The larger sizes are suitable for productive work. There are six sizes in two different types. One type suitable for all temperatures up to 1100° C. and type "B" for all temperatures up to 1250° C., supplied complete with pyrometers if required.

Sigma Instrument Company,

Letchworth.

This firm is demonstrating gas calorimeters, pressure, vacuum, and draught recorders, specific gravity recorders, automatic control of calorific value, and pressure regulators.

Stanton Ironworks Company, Ltd.,

Near Nottingham.

On the Stanton Company's stand are to be seen examples of Delavaud spun iron pipes, together with a range of mass-produced sand-cast "specials," including tees, bends, and collars. Micrographs and cut sections are used to show the dense centrifugal structure of the Delavaud spun metal, which, it is claimed, is 70% stronger than sand-cast iron. The Stanton Company have now sold approximately 8500 miles of Delavaud pipe, which is made in 3, 4, 5, and 6 yard lengths, and in diameters ranging from 3 in. to 20 in. The working model of the self-adjusting Stanton-Wilson joint, which attracted so much attention last year, is again on view. This model illustrates the joint's capacity for remaining leak-tight when constantly deflected under high pressures. The Stanton-Wilson joint is now used in gas, water, and sewage mains by over 200 undertakings.

The floor of the firm's stand is covered by the Stanton iron road, consisting of studded cast-iron sections designed to resist severe attrition. During recent months this product has been used with success by a number of local authorities and private undertakings.

A recent order for the Stanton iron road was received from the Broadstairs Gas Company, who have laid the Stanton iron road as an approach and surround to the elevator pit of a coke cutting and grading plant. The coke is conveyed from a coke-quenching platform in iron-wheeled hand-barrows—a form of traffic which would rapidly tear up a less permanent surface. The sections are equally suitable for use on gas-works yards, being laid over a concrete foundation which has been coated with bitumen.

The use of specially-cut sections is demonstrated surrounding a manhole-cover.

Stoves, Ltd.,

Rainhill, Liverpool.

This firm are exhibiting an excellent range of modern porcelain enamelled gas cookers which include the high-grade "Bakerloo" series, and the "Newhome" and "Kitchenette" popular models.

"Silo" gas fires in art black and various coloured finishes are displayed to advantage. The new "Step" pattern fuel, designed to give an unbroken appearance to the fire when lighted, should be specially noted. It can be obtained in both "Silo" step and "Briteray-Silo" step qualities. Other lines of interest are "Argyll" and "Spider" hotplates, "Glide" gas irons, and various gas boiling rings in black and coloured enamel finishes.

Stourbridge Refractories Company, Ltd.,

Shut End Works, Pensnett, nr. Dudley.

This firm are showing a comprehensive range of samples of their various high-class refractory and insulating bricks, blocks, and cements.

Wm. Sugg & Co., Ltd.,

Ranelagh Works, Westminster, S.W. 1.

Messrs. Sugg's exhibit is always of great interest to the public lighting engineer, who finds much to consider in the models of the latest street lamps which are exhibited, including the "Windsor," "Grosvenor," "Promenade," and, of course, the well-known upright "Rochester," of which over 2000 are in course of installation in the City of Westminster, under the contract given to the Gas Light and Coke Company. There is also the suspension "Rochester," which is being used widely for street lighting by central suspension and on bracket arms from tramway standards, &c. Nearly all of these exhibits display one or other of the "Directional" (rustless steel) or "Multi-Ray" (silvered glass) reflectors, both of which have been such important factors in securing street lighting contracts for gas.

Upright "Rochester" Lamp with Directional Reflector.

Chromium-plated "Rochester" Lamp, with Octagonal Opal Panels.

SUGG LAMPS.

The exhibits of fittings for interior lighting are a revelation in what can be done to provide really artistic lighting by gas and with all the convenience of control from the wall at hand level. The panelled pendants particularly are most attractive. Then there is a very interesting fitting for the outside lighting of business premises which have the modern metal shop fronts. This is a "Rochester" suspension lamp with octagonal panelled opal globe and the whole of the exterior metal portions chromium plated. It is fitted with Sugg's patent distant control device, permitting lighting and extinguishing from inside the premises.

For heating by gas, a representative range of the "Red Sphinx" gas fires is displayed. This fire has the incurved

fuel formation, and the models exhibited include those for the conversion to gas of ordinary coal grates, including the fashionable arched fireplace without canopy.

Exhibits for cooking and domestic purposes include the popular " Eton " cooker, a " Trafalgar " gas boiler, and an incinerator in mottled enamel finish for the hygienic destruction of rubbish. Gas engineers and their assistants will also find much of interest in the numerous exhibits of parts, components, and special fittings for various purposes.

A. G. Sutherland, Ltd.,

Warwick Road, Greet, Birmingham.

The exhibits of this firm are of considerable interest to gas engineers, embodying the latest developments in the manufacture of high-capacity meters. A full range of meters are shown, including the new small high-capacity meters. A special feature also is the new two-coin prepayment attachment, which takes either pennies or shillings in the same slot at the option of the consumer. In addition to the above, there is a full range of all types of Standard, high-capacity and gas fire meters, together with open meters for inspection.

Sutherland Meter Company, Ltd.,

Electric Avenue, Witton, Birmingham.

On this stand, in addition to ordinary, single coin, " Ducoin," and " Du-Slot " meters is an interesting demonstration and test meter designed to assist the salesman to demonstrate to prospective consumers the actual gas consumption of any apparatus such as gas fires, cookers, burners, &c. The consumption per hour is clearly shown by observation for one minute. The dial is 8 in. in diameter. A centre pointer demonstrates on the outer of two larger circles the hourly rate of consumption by one minute's observation. The inner circle is intended for testing purposes and represents 4 c.ft. per complete revolution, each foot divided into tenths.

Also demonstrated are meters specially constructed for Spain, Poland, and the Argentine, and large high-capacity meters mounted on wheels to facilitate handling.

Other exhibits include clockwork street lighting controllers and gauges.

Thomas Thorp & Co., Ltd.,

Manchester.

The following plant and apparatus are to be found on this firm's stand. Pressure indicators and recorders, consumption indicators and recorders, recording hygrometers, volumetric governors, anti-pulsators, compressors, gas mixing apparatus, industrial heating burners, high-pressure gas lighting, flashlight gas signs, and gas thermostats.

Timmis & Co., Ltd.,

River Stour Works, Stourbridge.

This firm are showing for the first time in this or, they believe, any other country an entirely new material for the construction of vertical gas retorts. They are exhibiting a section of a Glover-West retort constructed out of non-spalling " Rayax " (sillimanite). Though sillimanite bricks have been made in this country for some years, this is a marked development in a really dense non-spalling sillimanite brick, and it will certainly be of interest to the Gas Industry. They are showing a good many other articles made out of " Rayax " material, though these are not of particular interest to the Gas Industry. They are, however, showing both vertical and horizontal retorts made out of their " Lava " non-expanding aluminous material, which can be operated at temperatures commonly used by the Gas Industry in places where silica is now used, without the trouble which is caused by the low temperature expansion of silica. They are also exhibiting samples of " Timmis " brand of Stourbridge material, and of the well-known " Dome " brand insulating brick.

Vulcan Stove Company, Ltd.,

Exeter.

This firm's exhibit is more particularly devoted to glass door cookers, which are on show in coloured finishes besides the ordinary mottled enamel finishes.

Also shown is a selection of fires, including the new " Wainscot " fire, together with the " Alcides " and " Alcestis " fires, the design of which is a modern departure from the more general designs.

C. & W. Walker, Ltd.,

Midland Ironworks, Donnington.

As at previous Fairs, this firm are showing a number of photographs of gas-works plant—generally too large to exhibit in full size—illustrating work actually designed, fabricated, and erected, including guide-framed gasholders of 12,500,000 c.ft. capacity downwards, spirally-guided holders of 5 million c.ft. capacity downwards, and purifier installations of 8 million c.ft. capacity per day downwards.

Among the special features exhibited are the following:

A large model of a waterless holder on the Klönne system and also a full-size section through the seal between the piston and the holder shell, showing the latest form of attachment of the seal to the piston. The packing ring is composed of special indiarubber impregnated fabric separated by an annular ring filled and supplied with grease lubricant, and is pressed up against the side of the holder by means of weighted bell crank levers so as to permit expansion and contraction to take place readily and at the same time to give constant pressure on the sides of the holder to maintain gas-tightness under all conditions.

The Milbourne roller carriage for spirally-guided gasholders is a two-roller carriage and has been well tried in service for a number of years on holders of 5 million c.ft. capacity and downwards. The axles are lubricated from an oil bath arranged under each axle, and the oil is lifted therefrom by means of wicks and deposited into spiral grooves cut in the axle itself.

The Milbourne-Beard joint for purifier covers is the latest type of jointing between purifier cover and top; its outstanding and intrinsic qualities are apparent since the pad, which is held on each side throughout its entire length is, when in use, not only in contact with the planed surface of the purifier curb, but also in direct contact with the steel curb of the purifier cover, there being no intervening metal work between either of these two surfaces and the rubber pad. The pad itself is of special section, and when worn it can be easily removed and a new one inserted in the least possible time.

A vertical section through a 6 ft. diameter washer-scrubber for extraction of ammonia or removal of naphthalene from gas shows the rotating drum with its rough sawn boards in sectors which dip into the liquor or wash oil, as the case may be, in the lower part of the scrubber. These sectors can be removed with ease through manholes in the body of the washer and replaced after cleaning. A method of reducing slip to the very minimum between the rotating drums is clearly shown.

Also shown are electrically-welded steel flanged tees; steel pots (rectangular and circular) for annealing, case-hardening and heat-treatment, pressed from one piece of plate; a wood grid for purifiers, having oak sides and white deal taper bars, bolted together in a special machine, and planed all over after cramping together and bolting up; and " Audco " gas valve with rotating disc.

Waterless Gasholder Company, Ltd.,

13, Rood Lane, London, E.C. 3.

The waterless (M.A.N.) gasholder was introduced to this country in 1927, at which time it had already made considerable progress abroad. Although revolutionary in character as compared with the hitherto conventional types of gasholder, the advantages offered by the " waterless " have been readily appreciated by gas engineers and those concerned with storage of various gases. As a result, there are to date 32 waterless (M.A.N.) gasholders in Great Britain and Ireland, ranging in capacity from 250,000 to 8 million c.ft. and in use for a variety of storage purposes. The British Licensed Contractors responsible for the carrying-out of these contracts have also built a number of waterless gasholders for the Colonies and abroad. Apart from its technical advantages, the M.A.N. waterless gasholder represents a definite step towards that combination of utility and attractive appearance aimed at by designers of modern industrial structures. Architecturally, it has met with approval and, to quote the expressed view of one well-known F.R.I.B.A., " possesses a definite æsthetic quality." It is pleasing to find that a structure, the purpose of which is necessarily utilitarian, is, nevertheless, so designed that it does not unduly offend the eye of the multitude.

On their stand the Waterless Gasholder Company, Ltd., show a scale-model of the waterless holder arranged to reproduce the operation of the piston. A full-sized section of the tar seal is also exhibited, from which visitors can

obtain detailed information as to its construction and function. There is also on view a large selection of photographs, constructional drawings, &c.

Wm. Whitehouse & Co., Ltd.,

Empire Works, Brueton Street, Birmingham.

This firm are showing a number of new designs of gas lighting fixtures, including some finished chromium-plated with special burners and " Vitreosil " shades, also effective modern designs of gas candle lighting in which the burner is cleverly hidden by " Flakeoid " shades and drip candle tubes. There are many novel panel brackets and bowl fittings that are being shown with attractive glassware and screens, and, in addition to the general lighting display, examples of the firm's extensive manufactures of main gas cocks, small brass fittings, gas fire cocks, slot brackets, and pendants are exhibited.

Willey & Co.,

Exeter.

Messrs. Willey & Co. have an attractive exhibit with many interesting new features. Several glass panelled working models of " Radial " meters, both ordinary and prepayment and a 6000 c.ft. per hour skeleton meter demonstrate the special advantage attached to this type of meter. A large meter of 3000 c.ft. capacity is seen registering the gas consumed on the combined stand. There are also on

Willey's Silent "Du-Slot " Prepayment Meter.

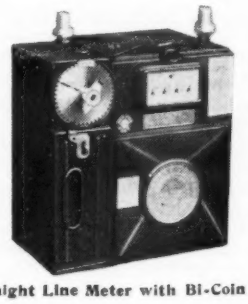
view several models of the new " Du-slot " attachment, constructed to take 1d. or 1s. with a separate slot for each. The simplicity of this coin action is striking and is demonstrated in a most attractive manner; a constant flow of coins passing through the attachment without apparent operation. The new range of meter capacities, recently adopted by the Gas Industry, is also shown. To replace eight sizes and many more types, by a range of four only, appears to be a real achievement which should prove of great advantage to gas undertakings, conserving useful space in consumers' houses and also in storing and transit.

George Wilson (Gas Meters), Ltd.,

Foleshill Road, Coventry.

The main feature of Messrs. George Wilson's stand is the demonstration of their straight line meter. Gas engineers are invited to examine and test this meter under any conditions—such is Messrs. Wilson's faith in this product. It is a return to simplicity of construction, and its many advantages are worthy of attention. New constructions in prepayment attachments—designed to reduce repair costs to a minimum—are shown, together with large working models of attachments.

The new small high-capacity meter is exhibited, and Messrs. Wilson's technical staff are in attendance to discuss with gas engineers the merits and demerits of this innovation.



Wilson's Straight Line Meter with Bi-Coin Attachment.

The results of a year's intensive research and experiment are open to all visitors to Messrs. Wilson's stand.

John Wright & Co., Ltd. (Radiation Ltd., Proprietors),

Birmingham.

A complete range of " Sunhot " water heaters is shown by John Wright & Co., Ltd., and will invite a good deal of attention on account of the application of the " no condense " feature. This is an important advance in storage water heaters, and a feature which will commend itself. The new " no condense " series of " Sunhot " water heaters embraces the standard and copper types in calorifier pattern for " hard " water; and also the ball-valve type. All " Sunhot " water heaters in the " no condense " series are complete with temperature indicating studs and are supplied in the attractive new " Sunsheen " white finish. This is a finish which will grace any kitchen or bathroom, and is most durable.

The "K.C.U." The "Sunhot."
WRIGHT'S WATER HEATERS.

The " K.C.U." water heater which has met with such success since its introduction a few months ago is repre-

sented by an additional model, with removable interior, specially designed for "hard" water districts—further evidence of the way in which John Wright & Co., Ltd., are applying themselves to all problems in hot water apparatus construction, with the one aim of providing gas appliances of high efficiency and—which is of importance to gas undertakings—of low maintenance cost.

A "B.T.U." hot-water circulator, the No. 2730, is displayed mounted on a stand. This heater is the well-known method of delivering hot water into an existing storage tank, and, if necessary, to work in conjunction with the coal range boiler.

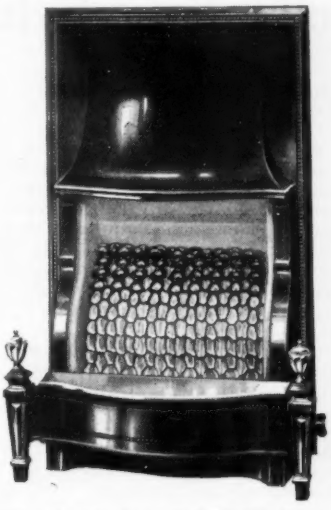
A comprehensive display of "Eureka" "New World" "Regulo"-controlled gas cookers and ranges in both the "Rado" mottled enamel and "Beau" finishes, in pleasing schemes of olive green and cream, or brown and buff, have been instrumental in bringing colour into the kitchen. The various 1933 features of these cookers include the embossed enamelled door and exterior side panels, the covered door hinges and octagonal easy-grip door knob, &c.

The popular "Console" cabinet radiator is on show in the walnut grain finish. This new radiator has received most favourable approval by architects, who are much impressed by the simple dignity of its lines. It is a radiator which will harmonize with any scheme of decoration.

Special mention should be made of the "Vandyke" fire in green texture "Sunsheen" finish which is to be seen inside the stand. This is an excellent finish.

Wilsons & Mathiesons, Ltd. (Radiation Ltd., Proprietors), Leeds.

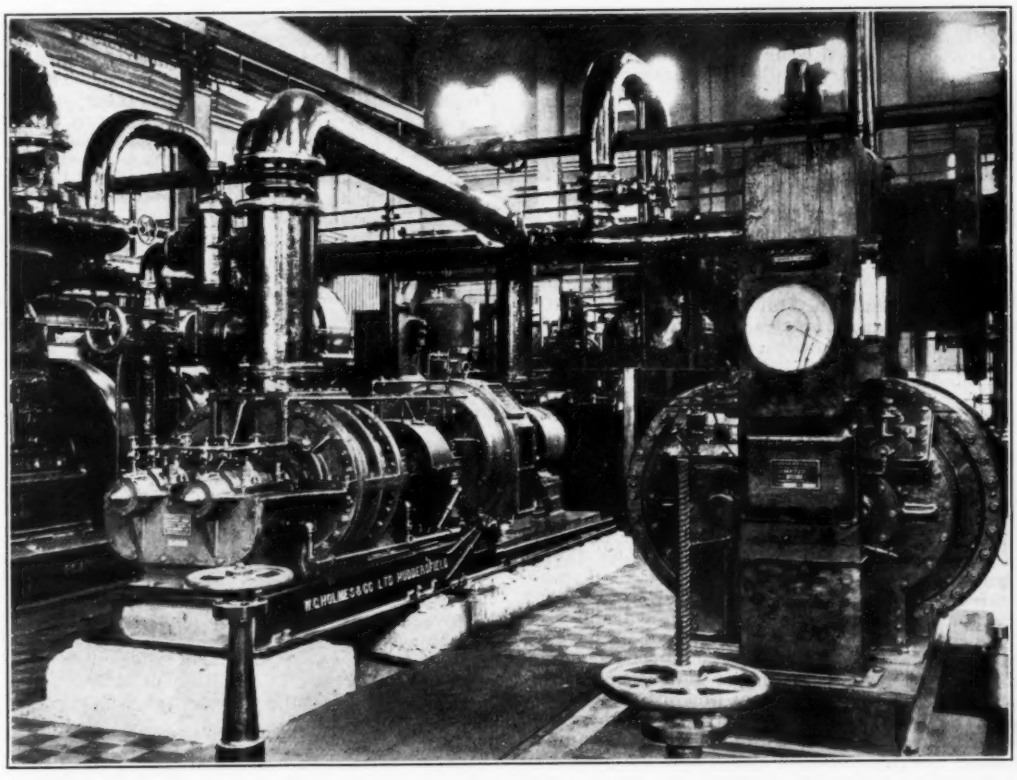
The "Sunbeam" "Major" gas fire shown by Wilsons & Mathiesons, Ltd., incorporates this firm's "Sunbeam" fire in a complete gas-fire frame of most interesting design. It has its own complete flue outlet with the "Injector-Ventilator" and provides a self-contained unit similar to



Wilson's "Sunbeam Major" Gas Fire.

the standard gas fire. It may thus be said to add all the usual advantages to the "Sunbeam's" own particular attractiveness.

Sheffield Gas Grid



The machine on the left-hand side of the photograph is one of Messrs. W. C. Holmes & Company's new high-speed Holmes-Connersville boosters, suitable for compressing gas up to 12 lbs. per sq. in. at the rate of 4 million c.ft. per diem, direct coupled, without reduction gearing, to an electric motor, and in use on a coke oven plant in connection with the Sheffield Gas Grid. On the right of the picture is a Holmes-Connersville meter registering the coke oven gas sold to the Sheffield Gas Company.

Miscellaneous Exhibits of Interest to Our Readers

Ashmore, Benson, Pease, & Co., Ltd.,

Stockton-on-Tees.

" Fista " welded steel poles as exhibited by this firm in, and being used for the purpose of supporting the conductors necessary for the supply of current in connection with the lighting of, the Quarry to Road Section of the Fair, are of Britsh conception, development, and manufacture throughout, and are fabricated at the firm's Parkfield Works, Stockton-on-Tees, from British material. " Fista " poles were originally developed for overhead electrical transmission lines, but are eminently suitable for lighting standards.

They are made of mild steel in a hollow rectangular box section, stepped or tapered from the base upwards, and welded continuously throughout the length. By welding on end plates the top and bottom are sealed and internal corrosion is prevented.

The method of construction allows of the metal being placed where it is required for maximum strength, enabling materials of minimum gauge to be used, thus combining lightness with strength.

W. & T. Avery, Ltd.,

Soho Foundry, Birmingham,

This year Avery's have a striking stand and display, with a number of working exhibits. Machines shown for the first time include a new visible indicating universal testing machine, and a dual-ratio counting machine. Every exhibit is the latest. An industrial visible weigher is shown installed in a roller conveyor system and a visible self-indicating hopper scale is erected so that demonstrations can be given.

As a continuous working exhibit, the Avery automatic grain weigher complete with elevator, will attract considerable attention. This type of machine is used in flour mills and granaries throughout the world, and similar types are made for handling coal, pulverized fuel, chemicals, fertilizers, and any dry free-running material. No operator is required in connection with these machines, which work continuously, being operated by the material flowing under gravity. A batch mixing machine which has been fitted specially with glass sides is another continuous working exhibit.

Other exhibits include a gravitometer for ascertaining quickly the specific gravity of liquids. A similar apparatus is available for ascertaining the specific gravity of solid bodies. Very large machinery such as weighbridges for weighing road and railway traffic are represented by means of fine enlarged photographs.

Baldwins, Ltd.,

Stourport.

Prominent on this stand are Staffordshire heavily coated charcoal tinned sheets and tinplates, eminently suitable for the manufacture of gas meters.

Belliss & Morcom, Ltd.,

Ledsam Street Works, Birmingham.

Of special interest to the Gas Industry generally are the developments which have taken place during the last twelve months in connection with the running of internal combustion engines of the road vehicle type on coal gas. One of the biggest problems facing such a development was the question of storage, and it was seen immediately that high pressures would be necessary in order that a sufficient quantity of gas might be stored in a small space. It was decided to raise gas to a pressure of 3000 lbs. per sq. in., and for this purpose this firm designed and built the small gas compressor shown on their stand. This compressor built originally for experimental purposes only is capable of delivering 600 c.ft. of gas per hour when running at 500 r.p.m., and having a delivery pressure of 5000 lbs. per sq. in. The compressor is in operation on this stand throughout the duration of the Fair, and is discharging to a filling station situated immediately outside the main Fair building. This filling station is supplying gas to road vehicles which are available for demonstration purposes in the Fair grounds.

Other exhibits include the firm's latest design of Diesel engine, which is of the high-speed totally-enclosed type; also an air compressor and a steam engine, these being typically representative of their products.

British Road Tar Association,

17, Grosvenor Gardens, S.W. 1.

The British Road Tar Association's stand consists of an attractive cinema theatre, accommodating 45 people, in which the Association's industrial and general interest talking films entitled " Coal Mine to Road " and " The Highway " will be exhibited.

The film " Coal Mine to Road " has been shown at numerous cinema theatres in different parts of the country, and has attracted a considerable amount of attention. It shows that tar is an all-British material, the production and utilization of which gives employment to hundreds of thousands of workers throughout the country. The general interest film " The Highway " is being shown for the first time to the public during the period of the Fair. It traces the development of roads since the days of the early Britons, and shows the progress that has been brought about by the use of tar.

British tar to Standard Specification has all the characteristics essential for the construction of road surfaces capable of withstanding modern traffic conditions, and it is easy to apply and economical to maintain.

The British Road Tar Association extend a cordial welcome to all those who are interested in the construction and maintenance of roads to visit the stand, where every opportunity will be given to discuss questions relating to the use of tar for roads with technical representatives, who will be in attendance, and where they will have the opportunity of seeing the films.

British Thomson-Houston Company

Rugby.

The British Thomson-Houston Company's stand is in the same position as in previous years, but it is considerably larger. The stand structure consists of eight pillars, one at each of the outside corners, and one at each corner of a central office. These pillars are made of a new diffusing material—a glass impregnated fabric—stretched on a wooden framework, each pillar being internally lighted.

A few of the latest developments in B.T.H. electrical plant apparatus for all concerned in industry, commerce and recreation are shown on the stand. These exhibits are representative of the very wide range of B.T.H. equipment, with which every requirement can be met either by standard production or by the initiative of B.T.H. engineers in designing plant with characteristics to suit special problems. One of the exhibits is a B.T.H. variable speed A.C. (shunt characteristic) commutator motor, with push button control and speed indicator on pedestal. This motor is in operation under the control of visitors. The British Thomson-Houston Company were pioneers in the development of this motor; the first B.T.H. motors of this type were installed in 1916 and have been in continuous service with the most satisfactory results ever since. A " No-Lag " power factor correction motor is also shown. " No-Lag " motors operate as ordinary induction motors but at unity or leading power factor.

A range of B.T.H. fractional H.P. motors, including seven sizes (from 1/100th to 1 H.P.) is also represented. This impressive display occupies a prominent position on the stand and will convey some idea to the visitor of the comprehensive range of small power motors manufactured by this Company.

Publicly shown and demonstrated for the first time is one of the range of B.T.H. electro-hydraulic thrustors. This device is a self-contained unit giving a smooth straight line thrust through a given stroke. Among its functions are the application of pressure, actuation of lever mechanism, or replacement of muscular effort on foot or hand operated machines. An application is for gear changing on heavy machine tools, control being effected from the working point.

Many other exhibits of interest are included.

Cambridge Instrument Company. Ltd.,

45, Grosvenor Place, London, S.W. 1.

Among the many instruments this firm are exhibiting at the Fair is a self-contained gas regulator suitable for many purposes. Our photograph shows the instrument as adapted for use as a linotype pot controller. When fitted with a modified form of bulb, the regulator is suitable for use in other applications such as the control of bakelite

presses; the bulb can be also fitted with a union connection, when it is suitable for use in controlling the gas supply to water heaters. The regulator is fitted with ⅜ in. or ½ in. inlet and outlet ports. Its use entails the minimum alteration to existing pipelines, since an internal by-pass is incorporated in the instrument. A modification of this instrument is supplied which controls a relay gas valve, thus enabling large ovens, &c., with, say, 2 in. diameter gas supply, to be regulated. The regulator is provided with a length of capillary tubing and the bulb connection, as already indicated, may be a rigid stem or other form, depending upon the particular application.

Cambridge 4 in. Dial Gas Regulator.

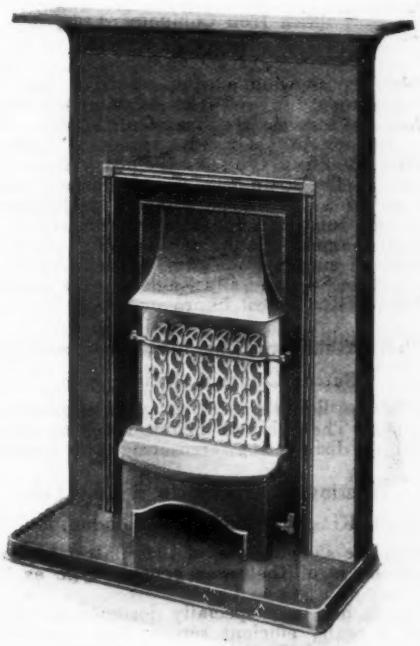
Cambridge New Model B Recorder giving two records on one chart.

Among the other instruments in which our readers will be interested is the new Model B Recorder, which is an inexpensive form of recording instrument and has been recently re-designed to enable two records to be obtained on one chart, only one thread being employed. The two records are clearly distinguishable, different rates of dotting being adopted for the separate records.

Carron Company,

Carron, Falkirk.

In a display representative of their many interests, Carron Company, Carron, Stirlingshire, include examples of their gas cooking and heating appliances. The Company show one of their all-enamelled cookers to which is fitted the "Carrontrol" heat regulator. Two gas fires are on view, and they also are enamelled. In one of them a pedestal boiling burner has been added, increasing its usefulness. Gas mantel registers now find a place in housing schemes, &c., and two examples are on view. A feature of one is that the mantel is enamelled in imitation of walnut. This imitation finish, which is rich and natural in appearance, has the advantage of being unaffected by heat or other climatic conditions. Beyond an ordinary dust or an occasional rub with a damp cloth, cleaning is almost unnecessary.



New Carron Gas Mantel Register Grate.

The illustration shows one of Carron's latest gas mantel registers, medium size pattern, with seven radiants and raised hearth plate. All interior parts, including firebricks, are removable by simply detaching the fuel bar. The appliance is complete with cast-iron hearth plate and brass inlet tap, and is finished fine cast and blacked or painted one coat. The mantel register can be further finished in metallic enamel, in imitation wood—mahogany, walnut, rosewood, oak, &c.

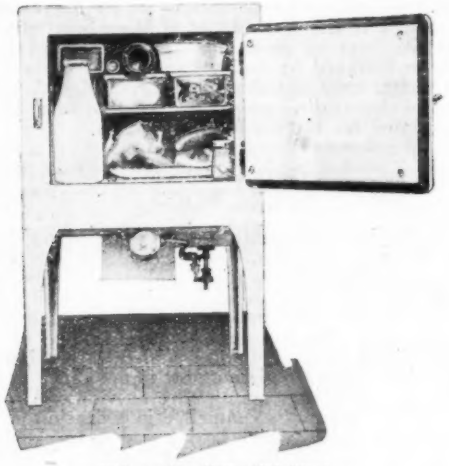
Electrolux, Ltd.,

153-155, Regent Street, London, W. 1.

Messrs. Electrolux, Ltd., in the Heating and Cooking Section, are exhibiting a wide range of "Freezolux" cabinets. A distinctive feature will be the famous "Freezolux Minor," a new low priced, self-contained, automatic refrigerator.

With the "Minor" model, as in all other "Freezolux" cabinets, a gas flame replaces motors, compressors, and all moving parts and produces perfect refrigeration, automatically and silently. The "Minor" is air-cooled, needs no water supply, and, costing only £19 10s. cash, brings the

advantages of refrigeration within reach of all. Gas-operated "Freezolux" refrigerators represent a most economical and dependable method of preserving and preventing wastage of food.



"Freezolux Minor" Cabinet.

Falkirk Iron Company, Ltd.,

Falkirk.

This firm are showing a comprehensive range of the latest developments in cast-iron goods in the way of fireplaces and cooking installations of all kinds. Particular interest attaches to their new series of "smoothtop" cookers, both domestic type and the heavy duty "Falcon" gas ranges. The domestic "smoothtops" have been brought up to a very high point of perfection both in efficiency and finish and are being shown in very pleasing effects of all-enamel. A suite of "Falcon" gas ranges with bain-marie, as supplied recently to some of the leading caterers both in Scotland and England, is a special exhibit and shows the very latest improvements.

Four Oaks Spraying Machine Company,

Sutton Coldfield, Birmingham.

Labour-saving liquid cement spraying apparatus is shown by this firm. The exhibits include spraying machines for whitewashing, disinfecting, creosoting, and painting.

Huntington, Heberlein & Co., Ltd.,

47-51, King William Street, London, E.C. 4.

This firm are showing one of their latest type of jigging screens which is of the same general type as their coke screen.

This screen has been specially designed to meet the demand for a really efficient screen, less expensive than a vibrating screen and with greater flexibility as regards points of discharge. The standard jigging screen is designed with one, two, or three superimposed mesh frames, giving 2, 3, or 4 graded products. The standard screens are all 6 ft. long, and are made either 1 ft., 2 ft., or 3 ft. wide. The jigging screen is a conveyor as well as a screen. The material to be graded is fed on at the end and is conveyed forward by the jigging motion. Each machine is designed to suit the particular work for which it is required. For greater lengths than 25 ft., two or more machines are run in tandem. Discharges can be arranged to suit any lay-out. The screen is also designed with a blank plate bottom with discharges from each mesh over either side of the body, so that largest sizes are removed first, and only the smalls reach the finest mesh instead of loading this with the whole of the feed. Wear and tear of meshes is minimized, and screening efficiency is thereby greatly improved. Fine dust can be efficiently removed, while it is claimed that large sizes, once separated, cannot be contaminated by subsequent breakage.

Gittings & Hills, Ltd.,

Birmingham.

This firm are specialists in the development of modern industrial finishes, and their exhibits offer much of interest to the many trades now employing colour and artistic finishes for a variety of articles—both those which fall into the category of strict utility and those of a more decorative appeal. On the Company's stand are examples of finishes produced with "Rockland" synthetic vitreous enamels and lacquers—a material claimed to give a finish similar in character to that of vitreous enamelling without the high cost which the latter involves.

Also displayed are decorative panels showing the new "Fouramel" and varnishes; panels showing various textural designs obtained by the use of "Strip-Plex"—a plastic paint composition; high-temperature and low-temperature oil stoving enamels, including the "Tower" brand material for continuous conveyor ovens or box ovens; together with "Metalard" tool and machinery enamel finishes on small articles, which dries very hard in less than four hours. It is stated to be entirely oil-proof and very durable. A great variety of articles are shown in these various finishes.

Thomas Howse, Ltd.,

Blackheath, near Birmingham.

This firm are again exhibiting their standard lines of industrial and decorative finishes for all purposes. In addition, several new finishes are on show, including airdrying and stoving synthetic resin finishes, and "Infuselax" finishes for gas heaters.

Imperial Chemical Industries, Ltd.,

Millbank, S.W. 1.

Nobel Chemical Finishes are exhibiting a wide range of their products. Their stand this year makes a special feature first of the "Dulux" range of finishes, and secondly of the Nobel low bake and heat-resisting enamels, which have also a synthetic base or vehicle. The "Dulux" range includes air-drying and stoving finishes for brush and spray application by the roller coating process. The Nobel enamels have been developed particularly for use on gas fires and are supplied in a variety of colours. It is particularly interesting to note that fires already painted may be refinished in Nobel heat-resisting enamels to any shade desired by the application of one coat only. Some indication of the fancy effects other than straight colour which can be obtained with these products are given by exhibits on the stand. In addition to their heat-resisting properties, these enamels will not discolour under prolonged heat, nor will they chip or crack with age.

If any recent chemical process has appealed to the public imagination, it is the degreasing and cleaning of metal by means of trichlorethylene, a non-inflammable solvent. The degreasing exhibit includes several entirely new types of plant, which are capable of removing dirt, grease, &c., from practically every type of metal article—hollow, solid, or of intricate design—and of turning them out clean, dry, and ready for plating, lacquering, rust-proofing, &c. One of the objects aimed at with success during the year is the handling of small parts in such a way that these can be tipped into a plant without separation and emerge at the other end absolutely clean without any rumbling, rotation, separation, or mechanical agitation whatsoever. This is precisely what electro-platers or producers of finely finished articles require, so as to minimize the risk of scratching or damaging highly-finished surfaces.

The case-hardening exhibit is organized by the Cassel Cyanide Company, Ltd., a subsidiary of I.C.I., who are showing a selection from their extensive range of salt-bath furnaces. The use of molten salt for the heat treatment of metals has been gaining steadily in popularity in recent years. It has the great advantage of not impairing in any way the surface of the parts which, in the case of bright finished material, is still bright after hardening. An interesting exhibit is a twin pot furnace for simultaneous carburizing and heat-treatment, capable of taking parts up to 12 in. diameter by 32 in. long.

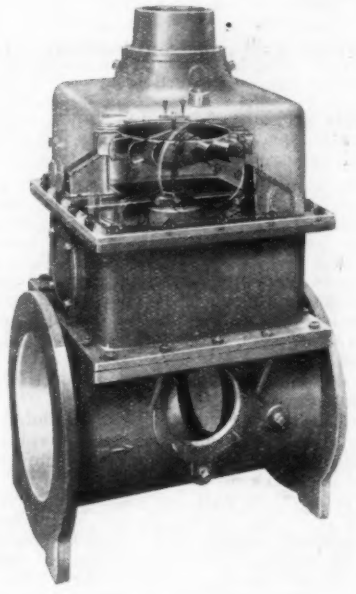
George Kent, Ltd.,

Luton, Beds.

Messrs. George Kent, Ltd., are showing examples of their latest types of meters and control apparatus of almost every kind. These meters cover every branch of fluid metering.

One of the most interesting exhibits is the master control panel, as used on the automatic boiler control system which has been evolved by this firm. A complete set of this equipment was recently installed at Hackney Power Station, where it is working very successfully. A complete range of panel-mounted instruments for boiler houses is also included. These include combustion efficiency meters, boiler feed meters, steam flow meters, temperature recorders, pressure recorders, draught gauges, &c. Another item of interest is the example of their tele-recording meters, similar to those which are now being supplied by

Messrs. George Kent, Ltd., for large overseas contracts. The temperature, pressure, and flow controllers exhibited have not been shown at this exhibition before, and they are interesting and of ingenious design. A range of steam meters, air meters, and gas meters for the economical running of industrial plants also make a good display.



Kent's Shunt Gas Meter.

Finally, the firm are exhibiting again their well-known venturi meter, which is used for the bulk measurement of fluids of all kinds, also weir and level recorders, trade water meters, oil meters, and petrol meters.

London Aluminium Company, Ltd.,

Westwood Road, Witton, Birmingham, 6.

The London Aluminium Company take some small pride in their record of 35 years of continuous work and development, and their exhibit is always a centre of interest. "Diamond" brand aluminium ware is too well-known to need comment other than reference to some of the new lines and policies of this firm. While quality has been maintained, prices are distinctly lower, this being due to the adoption of more efficient methods of producing. For example, a three-tier machine made aluminium steam cooker can now be bought in a shop for 14s. An interesting item is the new "Modern" teapot with its clean-cut lines indicative of the present tendencies in design. An attractive feature of this Company's exhibit will be the daily cooking demonstration by Mrs. Mary Hamilton, the well-known Gold Medal culinary expert. Such of the Company's special lines as the "Top-Hat" cooker, the "Stokes" cooker, "Bolton" twin pans, and the electric hotplate ware, will be shown in practical use by Mrs. Hamilton.

Martineau & Smith,

Birmingham.

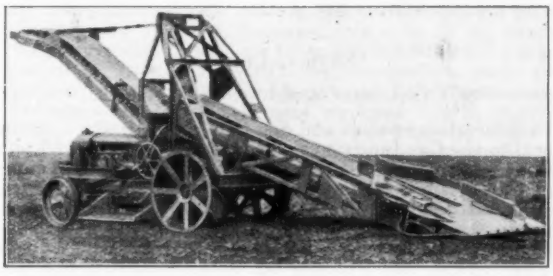
The specialties shown by this firm include flexible tube cocks, main cocks, gas and nose cocks, union joints, and pendants and brackets for automatic services.

Mavor & Coulson, Ltd.,

47, Broad Street, Glasgow.

This firm are exhibiting their M. & C. Joy loader, which is demonstrated loading over two cubic yards of gravel per minute. Loose material is loaded rapidly from heaps into wagons, lorries, or into a conveyor, by this loader. Two powerful gathering arms sweep the material on to the loader, which delivers where required. The loader eliminates hand shovelling. It is self-propelling, and can be manœuvred and worked on uneven ground under complete control.

The Joy Loader propels itself, by paraffin, petrol, electricity, or compressed air motor, either at a slow speed for feeding into the pile, or at a travelling speed for moving from place to place. While it manœuvres, the rear conveyor is swung sideways to keep the delivery at the correct



M. & C. Joy Loader.

point. The machine is handled by one man. The capacity of the type shown is 2·2 cubic yards per minute (1½ tons of coal per minute), but a larger machine is also available.

Meldrums, Ltd.,

Timperley, Manchester.

The chief item of interest on Messrs. Meldrum's stand is one of their sprinkler mechanical stokers. This is shown attached to one flue of a Lancashire boiler, and is of the fixed grate pattern. By the side of this exhibit is shown a set of moving bars, and an additional exhibit also shows their hand-rocking grate. Any of these alternatives can be provided with the "Meldrum" stoker to suit the particular fuel and the conditions under which the boiler is operating.

The firm also exhibit one of their hand-fired furnaces. These are suitable for forced draught by means of either fan or steam jet. This furnace is shown with the "Meldrum" smoke eliminator in the deadplate and also the special bridge with cavity for air admission. With these controls any Lancashire boiler can be fired smokelessly, with any kind of fuel and under any condition of load. An item of interest is the "Meldrum" smoke door for eliminating smoke on vertical and locomotive type boilers. Many complete cures have been effected, both when the boiler is fitted with the "Meldrum" forced draught system and also when working under natural draught. The destructors manufactured by Messrs. Meldrums are exhibited in the form of one of their No. 1 steel cased models and a circular cast-iron pattern for smaller users. The steel cased pattern can be supplied in sizes capable of burning from 25 lbs. up to 2 or 3 tons per hour. The smaller sizes are sent out lined ready for use.

Newton Chambers & Co., Ltd.,

Sheffield.

The exhibit of this firm takes the form of a section of road laid in "Duroid." The technical staff of the firm is available to discuss problems connected with coke grading, screening, conveying and storage plant, and so on.

Norwich Union Insurance Societies.

The Norwich Union Insurance Societies stage a display to illustrate the wide extent of the services rendered by them. The display has special reference to machinery and plant. The services of inspection and insurance usually associated particularly with power plant and prime movers may be extended to practically any type of process plant.

The Norwich Union has for some years specialized in third party insurance for gas undertakings. In order to be adequately protected, gas undertakings require an insurance which shall indemnify them against claims by the public, in respect of personal injury or property damage due to fire or explosion in connection with the gasholders, pipes, stoves, or meters, or in connection with the fixing of gas pipes or fittings, and also in respect of any injury or damage other than fire or explosion which might be caused by the fault or negligence of the undertaking's employees when about the business of the undertaking.

To this special cover the Norwich Union has now added its scheme for the inspection and insurance of gasholders. The exhibit illustrates, by means of a model railway, how insurance forms the step to security in business.

Rotherham & Sons, Ltd.,

Coventry.

This firm are exhibiting a varied range of small brass parts which are utilized extensively in the Gas Industry.

These include such items as ratchet toothed wheels, bevel wheels, spoked gear wheels, steel gears, pinion shafts, quadrants, and special parts for pressure gauge movements, hair springs, escapements in various sizes, and a variety of special movements for gas meters, speedometers, &c.

Skylux, Ltd.,

22, Great Saint Andrew Street, W.C. 2.

An interesting exhibit and one that should make a strong appeal to the Gas Industry is the " Skylux " improved pipe pusher, which is an all-British production. It pushes pipes up to 2 in. (bore diameter) through solid earth, and will push metal pipes under paved streets and lay pipes from cellar to street mains. The pusher will drive out old and replace with new pipes, and will operate in any soil a spade will dig. It is powerful and compact in construction and rapid in operation. Made entirely of steel, the makers claim that it will save 80% of the trenching cost, while every part is replaceable.

Jas. Southerton & Son,

Birmingham.

Hot stamped or cast fittings, and brackets and pendants for automatic services, are shown by this firm.

Spencer-Bonecourt, Ltd.,

London.

The exhibit of this firm consists entirely of photographs and drawings of typical waste-heat recovery installations on steel-making plant, carbonizing plant, and on internal combustion engine exhausts.

" Spiro " Ball Bearing Company, Ltd.,

" Spiro " Works, Kettering.

This firm are showing models of their " Spiro " patent portable screwing machines. These machines are a new departure in pipe screwing and have been designed to save power, weight, and also to give a higher quality to the finished product, the principle being that all threads are milled by a circular cutter. This method ensures that all rough, torn, and crossed threads are eliminated. The machines are really portable, which is of the greatest importance, while the moving parts are few in number. Each type is supplied with two cutters and 12 ft. of rubber-covered three-wire cable permitting earth connection.

Stavelev Coal and Iron Company, Ltd.,

Chesterfield.

This exhibit includes sand spun pipes, cast-iron pipes (vertically cast), specials, flexible joints for cast-iron pipes, chemical and bye-products, and tarred slag.

Stewarts & Lloyds, Ltd.,

Glasgow.

This firm are showing gas tubes and fittings, covering mains, distribution pipes, and service connections.

A " Victaulic " wriggling model, in which a lighted gas burner is fixed on each section of the main, demonstrates the tightness of the joint when subjected to movement. Outdoors a demonstration is given of jointing tubes with Victaulic joints.

A new joint designed for use with plain ended pipes is the Johnson coupling. It permits, at each coupling, an angular deviation of 5° and also longitudinal movement. It is efficient, and is easily and quickly laid.

A new type of steel pole for gas lighting is on exhibition. Model poles are shown on the stand and full-sized poles in an outdoor exhibit. The novelty consists in doing away with all internal pipe connections by using the pole itself as the connecting pipe between the service connection and the lamp. The bottom of the pole is closed by a plate which is welded in, and the lamp is either mounted on the top of the pole or carried on bracket arms. In the latter case the arms are hollow and communicate with the interior of the pole, thus supplying gas to the lamp. It is claimed

STANTON
DELAVAUD
Spun Iron Pipes
3, 4, 5 and 6 Yards Long
STANTON SPUN 6 YARDS LONG
STANTON SPUN 5 YARDS LONG
STANTON SPUN 4 YARDS LONG
STANTON SPUN 3 YARDS LONG
The Stanton Ironworks Company Limited Nr. Nottingham

that the design enables lamps to be erected more rapidly and cheaply and put into service more speedily than when cast-iron standards are used.

John Thompson, Ltd.,

Wolverhampton.

Among the exhibits of this firm are the following: (1) "John Thompson" self-contained economic boiler 15 ft. 6 in. long by 9 ft. 9 in. diameter for 200 lbs. water pressure (this type of boiler is particularly suitable for hotels, laundries, institutions, and buildings where space is limited); (2) John Thompson sectional superheater; (3) vertical multitubular boiler 11 ft. high by 5 ft. diameter for 120 lbs. water pressure; (4) water gas welded chemical container 23 ft. 9 in. long by 8 ft. 6 in. diameter. The water gas welded container is a vessel in which the whole cylinder is welded up into one solid piece, containing only one manhole, and this is situated on the body portion. This container has been manufactured by a specially designed apparatus, and is the result of several years experimenting at the firm's works at Wolverhampton. Also shown is a section of an electrically welded high-pressure water tube boiler drum 2 in. thick. This exhibit shows the progress made in electric welding for such high-pressure drums, welded up with the firm's patent electrodes.

Valor Company, Ltd.,

Birmingham.

This firm manufacture various types of fire extinguishers, which are claimed to act at once, killing the fire effectively and with little effort. They are easily handled and understood, lasting for years without causing damage to the charge. Various patterns are shown on the firm's stand, including the reversible pattern in one, two, and three gallon sizes, manufactured specially for export, the formula for re-charging being shown, saving sending to England for re-charges. Smaller quart pump patterns are suitable for all motor vehicles and electrical establishments; they kill petrol fires and run no risk of electric shocks.

Walker, Crosweller & Co., Ltd.,

20, Queen Elizabeth Street, London, S.E. 1.

This firm are showing examples of their Arkon pressure and vacuum recorders. These are sensitive recorders ranging from 0·2 in. W.G. pressure to 0·4 in. W.G. vacuum, which is commonly used for recording retort bench vacuum. A special feature is made of two-pen recorders, particularly two-pen reversion recorders for showing the movements of the regenerator reversal valve on open hearth steel furnaces. This is connected to the gas and air ducts and shows by a number of rectangular records each time the valves are operated and the pressure and vacuum existing in the ducts at the time. Another two-pen recorder has a range of 6 in. vacuum and is connected to the inlet and outlet sides of the waste-heat boiler and shows the rate of dust accumulation which causes the records to diverge.

They are also showing their Arkon gas and air flow recorders, which are used in many gas-works for the measurement of foul retort gas, gas to purifiers, air to purifiers, gas to split streams, gas to districts, chimney gas as a diluent, &c., besides being in use in blast furnace works for the measurement of blast furnace gas flowing to Cowper stoves and gasfired boilers, &c. In addition, they are showing their well-known Arkon full-scale gauges, and single column gauges, and the Dielectrimeter, which is a portable instrument for testing the dielectric strength of transformer and other oils.

Low-Temperature Carbonization.

Litigation between Sensible Heat Distillation, Ltd., and British Coal Distillation, Ltd., was mentioned to Mr. Justice Swift in the King's Bench Division on Wednesday last.

His Lordship was informed that the litigation had been somewhat protracted, but the two Companies had now arrived at a settlement, one of the terms of which was that this action should be withdrawn, both parties to pay their own costs.

It was announced by Counsel for the defendants that an amicable agreement had been reached, and an order was made accordingly, and a sum of money in Court that had been put in as security for costs was ordered to be paid out.

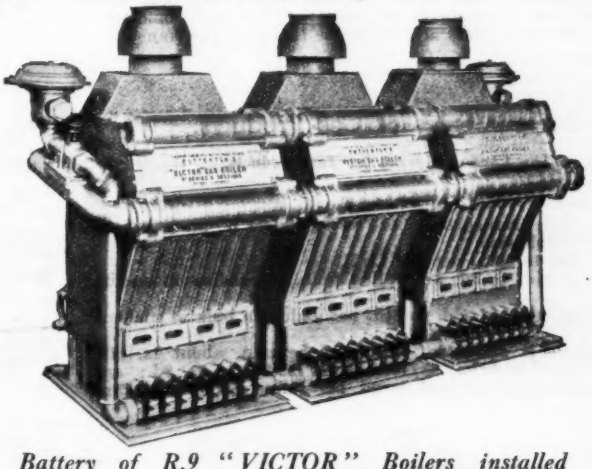
POTTERTON'S CENTRAL HEATING

AT

BRITISH INDUSTRIES FAIR — COTTON TRADES SECTION

WHITE CITY, WOOD LANE, LONDON, W 12

The success of the Heating Equipment provided in previous years at the Textiles Exhibition has resulted in the re-adoption of "VICTOR" Gas Fired Boilers for this important work, the overhead galleries of upwards half-a-mile in length being warmed by hot water, together with the Fashion Parade in which a combination of Radiant Panels and convection heating is provided.



Battery of R.9 "VICTOR" Boilers installed for heating the Dressing Rooms, Balconies, and Promenade of the Mannequin Parade (output 672,000 B.Th.U. per hour.)

Catalogue of Automatic Thermal Storage Water Heaters for Hot Water Supply and Central Heating Plant on request.

THOMAS POTTERTON (HEATING ENGINEERS) LTD.

RAVENSWOOD ROAD, BALHAM, LONDON, S.W. 12

Telephone: Balham 1244-5-6. *Telegrams:* Potterton, Bal, London.

GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see opposite page.]

The position in the Far East between Japan and China, the uncertainty with regard to the political outlook in Germany, and the banking moratorium in the State of Michigan were all factors tending to reduce Stock Exchange business last week. The gilt-edged market was practically the only one to remain firm throughout, the British stocks the centre of attraction to investors both at home and abroad, and prices finished practically higher on the week. With few exceptions, other sections were featureless, though steady conditions prevailed at the close.

The increasing popularity of Gas stocks and shares shows no signs of abatement, and the volume of business last week was again heavy. That this popularity is well justified those with a knowledge of gas affairs are fully aware, but it is quite evident that a much larger investing public, after studying the records of the various companies showing the regularity of dividend payments and the financial solidity of the Industry, are realizing the soundness of gas stocks for permanent holdings. Prices, therefore, still continue to harden, and it will be seen in the Stock and Share List that a number of stocks showed substantial improvements.

An announcement of interest last week was that of an offer by the recently formed South Eastern Gas Corporation to purchase the issued capital of the Maidstone Gas Company. The stockholders of the Company are offered for each £100 capital stock, *ex* dividend accrued to December last, (1) £200 in cash; or (2) 200 South Eastern Gas Corporation redeemable 4½% cumulative preference shares of £1 each fully paid; or (3) 100 South Eastern Gas Corporation redeemable 4½% cumulative preference shares, fully paid, and 80 South Eastern Gas Corporation ordinary shares of £1 each fully paid. The offer is conditional upon the acceptance by holders of not less than 55% nominal capital of the Company, and is open till Feb. 25, 1933. The Company's stock a week ago was quoted at 165, but when the terms of the offer became known the price rose 25 points to 190.

Among last week's dividend announcements were the following: Bournemouth, 3½% on the maximum dividend stock, and 4¾% on the sliding-scale stock, making 7% and 9½% respectively for the year (the total dividends for 1931 being 7% and 9% respectively; Derby, a final dividend of 5%, making 8½% for the year (unchanged); Newcastle-upon-Tyne, a final dividend of £2 17s. 6d.%, making £5 7s. 6d.% for the year (unchanged); Sheffield, a final dividend of 3%, making 6% for the year (the same); and the Tottenham and District Company is distributing £3 7s. 6d.%, making £6 15s. for the year (unchanged).

Current Sales of Gas Products.

The London Market for Tar Products.

LONDON, *Feb.* 20.

There is little change to report in the prices of tar products, which are as follows:

Pitch is 95s. to 100s. per ton f.o.b.

Creosote is 3½d. to 5d. per gallon f.o.b., according to specification.

Refined tar is about 4½d. to 4½d. per gallon in bulk at makers' works.

Pure toluole is about 2s. 4d.; pure benzole, about 1s. 11d. to 2s.; solvent naphtha, 95/160, about 1s. 7d. to 1s. 8d.; and 90/140 pyridine bases, about 3s. 9d. per gallon naked at makers' works.

Tar Products in the Provinces.

Feb. 20.

The average prices of gas-works products during the week were: Gas-works tar, 34s. to 39s. Pitch—East Coast, 85s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 85s. f.o.b.* Toluole, naked, North, 1s. 9d. to 1s. 10d. Coal-tar crude naphtha, in bulk, North, 6d. to 6½d. Solvent naphtha, naked, North, 1s. 5½d. to 1s. 6d. Heavy naphtha, North, 10d. to 11d. Creosote, *ex* works, in bulk, North, liquid and salty, 2¼d. to 2¾d.; low gravity, 1¼d.; Scotland, 2¼d. to 2¾d. Heavy oils, in bulk, North, 4¾d. to 5¼d. Carbolic acid, 60's, 2s. 7d. to 2s. 8d. Naphthalene, £9 to £10. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Feb.* 18.

Quotations show little or no change during the week, but there is still a lack of orders, particularly for prompt delivery.

Crude gas-works tar.—The actual value is 45s. to 50s. per ton *ex* works.

Pitch.—The shipping season is almost finished, and the value is 85s. per ton f.o.b. Glasgow. In the home market, 85s. to 90s. per ton *ex* works in bulk is the current price.

Refined tar to Ministry of Transport Specification is inclined to be difficult; but distillers' prices remain steady at 3¾d. per gallon *ex* works in buyers' packages.

Creosote oil.—Production is in excess of demand, but prices are fairly steady. B.E.S.A. Specification is 2¾d. to 3¼d. per gallon; low gravity, 2½d. to 3d. per gallon; and neutral oil, 2¾d. to 3¼d. per gallon—all *ex* works in bulk.

Cresylic acid.—This market continues disappointing, and prices are purely nominal. Pale, 97/99%, is 10½d. to 11½d. per gallon; dark, 97/99%, 9½d. to 10½d. per gallon; and pale, 99/100%, 1s. 1½d. to 1s. 2½d. per gallon—all f.o.r. in buyers' packages.

Crude naphtha is scarce, and the price is firm at 4½d. to 5d. per gallon *ex* works, according to quantity and quality.

Solvent naphtha.—90/160 grade is 1s. 2d. to 1s. 3d. per gallon, and 90/190 grade is 11d. to 1s. per gallon.

Motor benzole.—The value to-day is 1s. 4d. to 1s. 5d. per gallon *ex* works in bulk.

Pyridines.—90/160 grade is 2s. 9d. to 3s. per gallon, and 90/140 grade 3s. to 3s. 3d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time.

	s. d.		s. d.	
Crude benzole	0 10½	to	0 11	per gallon at works
Motor ,, ...	1 6½	,,	1 7	,, ,, ,,
Pure ,, ...	1 10	,,	1 11	,, ,, ,,

Contracts Advertised To-Day.

Coal.

The Clacton Urban District Council invite tenders for the supply of gas coal. [Advert. on p. 507.]

Pipes and Specials.

The Clacton Urban District Council Gas and Water Department invite tenders for the supply of cast-iron pipes and specials. [Advert. on p. 507.]

Meters, Fittings, &c.

The Clonmel Corporation invite tenders for meters, &c. [Advert. on p. 508.]

Retorts, &c.

The Clonmel Corporation invite tenders for retort settings, &c. [Advert. on p. 508.]

New Capital Issues.

The Altrincham Gas Company offered for auction recently £4000 new capital in 400 £10 shares, divided into 10 lots of five shares each, and 35 lots of 10 shares each. Each lot of five shares were of the nominal value of £50 and each lot of 10 shares of the nominal value of £100 subject to conditions and all statutory regulations of the Company. The maximum dividend is 7%. The proceeds of the present sale will be applied to the extension of the manufacturing plant, and the cost of providing new mains and other apparatus rendered necessary by the continued expansion of the Company's business.

STOCK AND SHARE LIST.

Official Quotations on the London and Provincial Stock Exchanges.

[For Stock Market Report, see opposite page.]

Issue. £	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations. Feb. 18. (Provincial Exchanges Feb. 17.)	Rise or Fall on Week.	Transactions. Lowest and Highest Prices During the Week.
1,551,868	Stk.	Oct. 3	7½	7½	Alliance & Dublin Ord. ...	112—122	...	118½—119½
374,000	"	Jan. 9	4	4	Do. 4 p.c. Deb. ...	80—90	...	...
557,655	"	Aug. 22	7	7	Barnet Ord. 7 p.c.	147—152	...	...
300,000	1	Oct. 17	1/9½	1/4½	Bombay, Ltd.	24/—26/-	+1/-	21/9—25/6
178,280	Stk.	Aug. 22	9	9½	Bournemouth sliding scale	195—205	...	...
550,050	"	"	7	7	Do. 7 p.c. max. ...	150—160	...	158—159
439,160	"	"	6	6	Do. 6 p.c. Pref. ...	138—143	...	...
50,000	"	Dec. 19	3	3	Do. 3 p.c. Deb. ...	75—80	...	...
162,025	"	"	4	4	Do. 4 p.c. Deb. ...	98—103	...	...
210,000	"	"	5	5	Do. 5 p.c. Deb. ...	120—125	...	125
357,900	"	Aug. 22	7½	7½	Brighton, &c. 6 p.c. Con. ...	143—148	...	...
540,000	"	"	6½	6½	Do. 5 p.c. Con. ...	133—138	...	137—138½
195,500	"	"	6	6	Do. 6 p.c. B Pref.	135—145	...	139
1,487,500	"	Aug. 8	5	5	Bristol 5 p.c. max.	111—112*a*	...	...
120,420	"	Dec. 19	4	4	Do. 1st 4 p.c. Deb.	96—98*a*	...	...
217,870	"	"	4	4	Do. 2nd 4 p.c. Deb.	95—97*a*	...	...
328,790	"	"	5	5	Do. 5 p.c. Deb.	120—124*a*	...	...
855,000	"	Oct. 3	8	7	British Ord.	145—150	...	147—148
100,000	"	Dec. 19	7	7	Do. 7 p.c. Pref.	140—150	...	146
350,000	"	"	—	5½	Do. 5½ p.c. Pref.	105—110	...	...
120,000	"	"	4	4	Do. 4 p.c. Red. Deb. ...	95—100	+5	...
450,000	"	"	5	5	Do. 5 p.c. Red. Deb. ...	105—115	...	...
160,000	"	Jan. 9	5	5	Cambridge 5 p.c. Deb. ...	117—122	...	...
100,000	10	Dec. 5	6	6	Cape Town, Ltd.	7½—8½	...	8½—8½
100,000	10	Nov. 7	4½	4½	Do. 4½ p.c. Pref. ...	6—7	...	...
150,000	Stk.	Dec. 19	4½	4½	Do. 4½ p.c. Deb. ...	88—93	...	91—92
626,860	"	Aug. 8	6	6	Cardiff Con. Ord.	110—115	...	...
237,860	"	Jan. 9	2½	5	Do. 5 p.c. Red. Deb.	105—110	...	...
157,150	"	Aug. 8	6½	5	Chester 5 p.c. Ord.	93—98*b*	...	...
98,936	1	Oct. 17	2/-	2/-	Colombo, Ltd. Ord.	25/—30/-	...	...
24,500	1	Oct. 17	1/4½	1/4½	Do. 7 p.c. Pref. ...	19/—21/-	...	...
609,204	1	Oct. 17	/10'90	/11'47	Colonial Gas Assn. Ltd. Ord.	16/—18/-	...	...
296,053	1	"	1/2'54	1/8'30	Do. 8 p.c. Pref.	19/6—21/6	...	...
1,796,955	Stk.	Aug. 8	5½	5	Commercial Ord.	113—118	...	115½—117
475,000	"	Dec. 19	3	3	Do. 3 p.c. Deb. ...	75—80	...	78½
265,272	"	—	—	—	Do. 5 p.c. Deb. ...	117—122	...	...
807,560	"	Aug. 8	7	7	Croydon sliding scale ...	144—149	...	146½
469,590	"	"	5	5	Do. max. div.	98—103	...	...
500,000	"	Jan. 9	5	5	Do. 5 p.c. Deb.	117—122	...	...
542,270	"	Aug. 8	10	7	Derby Con.	150—160*c*	...	...
55,000	"	Jan. 9	4	4	Do. 4 p.c. Deb.	80—85*c*	...	...
209,000	"	Sept. 5	5	5	East Hull Ord. 5 p.c. ...	97—102	...	...
179,500	"	Aug. 22	5½	6	East Surrey Ord. 5 p.c. ...	120—125	+4	125
155,019	"	Dec. 19	5	5	Do. 5 p.c. Deb. ...	115—120	...	...
1,002,180	"	Sept. 19	†6½	†5	European, Ltd.	132—137	...	134—137
19,373,992	"	Aug. 8	5⅝	5⅝	Gas Light & Coke 4 p.c. Ord.	25/6—26/6*f*	...	26/—26/4½
2,600,000	"	"	3⅝	3⅝	Do. 3½ p.c. max. ...	82—87	...	84—86½
4,477,106	"	"	4	4	Do. 4 p.c. Con. Pref. ...	101—104	+1	101½—104
6,102,497	"	Dec. 19	3	3	Do. 3 p.c. Con. Deb. ...	77—81	+1	79—80
3,642,770	"	"	5	5	Do. 5 p.c. Red. Deb. ...	114—117	+1	115½—117
3,500,000	"	"	4½	4½	Do. 4½ p.c. Red. Deb. ...	110—113	+1	111—112
270,466	"	Aug. 22	—	6	Harrogate New Cons. ...	110—115	...	...
82,500	"	Aug. 22	7	7	Hastings & St. L. 5 p.c. Conv.	130—140	...	...
258,740	"	"	5½	5½	Do. 3½ p.c. Conv.	107—112	...	...
70,000	10	Oct. 17	†10	†10	Hongkong & China, Ltd. ...	9½—10½	...	...
218,260	Stk.	Aug. 22	6	6	Hornsey Con. 3½ p.c. ...	118—123	...	...
5,600,000	"	Nov. 21	14	10	Imperial Continental Cap.	210—220	...	213—216
223,130	"	Feb. 6	3½	3½	Do. 3½ p.c. Red. Deb.	89—94*f*	...	...
235,242	"	Aug. 8	8½	8½	Lea Bridge 5 p.c. Ord. ...	165—170	...	166—168
2,145,907	"	Aug. 22	6	6	Liverpool 5 p.c. Ord. ...	123—125*b*	...	...
245,500	"	Dec. 19	5	5	Do. 5 p.c. Red. Pref. ...	105—115*b*	...	...
306,083	"	Jan. 19	4	4	Do. 4 p.c. Deb. ...	99—101*b*	...	...
165,736	"	Sept. 5	10	8	Maidstone 5 p.c. Cap. ...	180—200	+25	...
56,176	"	Dec. 19	3	3	Do. 3 p.c. Deb. ...	68—73	...	...
75,000	5	Dec. 5	†10	†10	Malta & Mediterranean ...	8—9	...	...
392,000	—	Oct. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	98—103	...	...
231,978	Stk.	Sept. 5	5	5	M. S. Utility "C." Cons. ...	100—105	...	...
818,657	"	"	4	4	Do. 4 p.c. Cons. Pref.	90—95	...	94½—95
112,126	"	Jan. 9	4	4	Do. 4 p.c. Deb. ...	98—103	+3	98—100
148,955	"	"	5	5	Do. 5 p.c. Deb. ...	115—120	...	...
675,000	"	21 May '31	†6	†6	Montevideo, Ltd.	35—45	...	...
2,061,315	"	Aug. 8	5½	5	Newcastle & Gateshead Con.	23/8—24/3*d*	...	...
682,856	"	"	4	4	Do. 4 p.c. Pref. ...	97—99*d*	...	...
776,706	"	Jan. 9	3½	3½	Do. 3½ p.c. Deb. ...	89—91*d*	...	...
277,285	"	Nov. 7	5	5	Do. 5 p.c. Deb. '43...	103—107*d*	...	...
274,000	"	Aug. 8	5	5	Newport (Mon.) 5 p.c. max.	99—102*a*	...	...
199,940	"	Aug. 22	7½	7½	North Middlesex 6 p.c. Con.	135—145	...	...
396,160	"	Feb. 6	5	5	Northampton 5 p.c. max. ...	98—103*	...	...
300,000	"	Dec. 5	7	9	Oriental, Ltd.	112—117	...	116½
205,162	"	Dec. 19	8	8	Plym'th & Stonehouse 5 p.c.	140—150	...	148—150
504,416	"	Aug. 22	8	8	Portsm'th Con.Stk. 4 p.c.Std.	152—162	...	160
241,446	"	"	5	5	Do. 5 p.c. max. ...	97—102	...	...
114,000	"	Aug. 8	5	5	Preston 5 p.c. Pref.	105—110	...	...
686,312	"	Jan. 23	4	4	Primitiva 4 p.c. Rd. Db. 1911	82—87*	...	...
389,813	"	Dec. 19	4	4	Do. 4 p.c. Cons. Deb.	82—87	...	...
150,000	10	Sept. 19	6	6	San Paulo 6 p.c. Pref. ...	6⅞—7½	...	...
1,736,968	Stk.	Sept. 5	6	6	Sheffield Cons.	114—116*e*	...	...
95,000	"	Jan. 9	4	4	Do. 4 p.c. Deb.	91—95*e*	...	...
133,201	"	Sept. 5	5	8½	Shrewsbury 5 p.c. Ord. ...	118—123	...	...
90,000	10	June 6	15	15	South African	4—6	...	...
6,709,895	Stk.	Aug. 8	7	5	South Met. Ord.	124—129	...	127—130
1,135,812	"	"	6	6	Do. 6 p.c. Irred. Pf.	138—143	...	141—141½
850,000	"	—	—	—	Do. 4 p.c. Irred. Pf.	100—103	...	101½—103
1,895,445	"	Jan. 9	3	3	Do. 3 p.c. Deb. ...	77—81	+½	78½—80½
1 000,000	"	Jan. 23	5	5	Do. 5 p.c. Red. Deb.	108—113	...	...
209,820	"	Aug. 8	8½	8½	South Shields Con.	150—155*d*	...	...
1,543,795	"	Aug. 8	6	6	South Suburban Ord. 5 p.c.	122—127	...	124—126
300,000	"	"	5	5	Do. 5 p.c. Pref.	112—117	...	115—116
868,837	"	Dec. 19	5	5	Do. 5 p.c. Deb.	120—125	...	...
647,740	"	Aug. 22	5	5	Southampt'n Ord. 5 p.c. max.	105—110	...	109½—110
121,275	"	Dec. 19	4	4	Do. 4 p.c. Deb.	98—103	+3	101—101½
350,000	"	Aug. 8	—	2/-	Swansea 5½ p.c. Red. Pref.	110—114	...	...
200,000	"	Dec. 19	6½	6½	Do. 6½ p.c. Red. Deb.	103—108	...	...
1,076,490	"	Aug. 8	6½	6½	Tottenham and District Ord.	138—143	+6	140—141
300,000	"	"	5½	5½	Do. 5½ p.c. Pref. ...	120—125	...	...
199,005	"	Dec. 19	4	4	Do. 4 p.c. Deb. ...	98—103	+2	99½—101½
85,701	"	Sept. 19	6	6	Tuscan, Ltd., 6 p.c. Red. Db.	67—72	...	...
347,769	"	Aug. 22	7	7	Uxbridge, &c., 5 p.ct. ...	135—143	...	...
88,330	"	"	5	5	Do. 5 p.c. Pref. ...	110—115	...	...
1,322,220	"	July 4	7	7	Wandsworth Consolidated	140—145	...	...
1,096,373	"	"	5	5	Do. 5 p.c. Pref.	114—119	...	...
1,317,964	"	Dec. 19	5	5	Do. 5 p.c. Deb.	120—125	+2	123½—128½
158,400	"	Aug. 22	6*g*	5	Winchester W.&G.5p.c.Con	107—112	...	...

Quotations at :—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of stock. *g* Paid £3, including 10s. on account of back dividends. *Ex. div. † Paid free of income-tax. ‡ For year.

WIRE ROPE FLEXIBLE SLINGS —Galvanised

British-made, brand new, ⅝" dia., 4 tons breaking strain. Double with large thimble eye, length (on double) 6', **3 6**; 10', **4 3**; 14', **5 -** each. Carriage Forward.

BYFORDS Ltd.

Crice St. Works, Spon Lane, W. BROMWICH

(This announcement is inserted gratuitously.)

PETER—WITH ONE EXCEPTION

With one exception Peter is an ordinary little fellow. Chubby, likeable, just five-and-a-half, full of life and fun and on occasions—be it admitted—of naughtiness.

Just now Peter's rather important, for this is his first term at school, and he's grappling with the intricacies of "A B C" and "Twice Two": difficult subjects to all men of five-and-a-half, but even more difficult in Peter's case because—bad luck—he's totally blind. That's his One Exception.

Peter learns reading, writing, and 'rithmetic through the medium of "Braille"—dull stuff compared with the coloured picture books of most five-and-a-halfs. However, he's a stout lad is Peter, and he's making great progress.

Would you like to know more about him? How, in spite of his "One Exception," he is being educated, and, when older, technically trained and usefully employed.

There is a long waiting list of "Peters" throughout the British Isles, for whom training and accommodation must be provided in the immediate future.

Will you help with a donation or annual subscription? Any sum, large or small, will be gratefully received.

Here's a suggestion. Your eyesight is worth 3d. a year to you. Send Peter and his handicapped pals 3d. for every year you've had it. Now, please, in case it slips your memory. Good idea!

THE CHAIRMAN,

SCHOOL FOR THE BLIND

(Founded 1838).

Swiss Cottage, LONDON, N.W. 3

A&M GAS·METERS

TRAIN·THE·THERMS

THE·PARADE·OF·THE·THERMS

WORKING AT HIGH CAPACITY

Pick 'em up! Pick 'em up! Every beat of the swift moving feet is observed by Sergt. A. & M Meters. At the "double" or at the "slow" march he checks their every movement. His critical eye is ever on the look-out and he never has a "missing" list. Whether his therms are producing light, heat or power, he supervises with a mechanical efficiency. Are A.&M. Meters looking after your therms yet?

ALDER & MACKAY LIMITED

MAKE METERS OF METICULOUS MEASUREMENT

The ALDER & MACKAY HIGH-CAPACITY METER

This meter is constructed with a higher "capacity per revolution" than the standard and is not, therefore, speeded up to give larger capacity per hour. Our 80 ft. size has a revolution capacity of 25 ft. and consequently performs 320 revs. per hour at maximum load. This meter is perfectly sound, reliable and most efficient. Complete details will be gladly sent on request. Send us your enquiries or consult us on your problems.

ALDER & MACKAY LTD., EDINBURGH, LONDON & BRANCHES.

THE BENEFITS OF THE "DRI-GAS" PROCESS FROM THE SALES POINT OF VIEW . . .

As it is not possible to estimate precisely the revenue earning capacity of a Dri-Gas Plant before installation, the experience of Engineers who have distributed dehydrated gas over an extended period is of value. Mr. T. R. Cook, Engineer and Manager of the Blackpool Gas Department, in addressing the Lancashire District Salesman Circle says :

B·I·FAIR
BIRMINGHAM
FEB. 20 to MARCH 3
You are cordially invited to visit our
STAND No. 12-E3
A Pay Phone (FAIR 84) is available

"The best gas service must be based on the delivery of gas of a constant calorific value, specific gravity, and adequate pressure at all times of the day or night.

The Dri-Gas Process is giving excellent results in the prevention of waterlogged services, and also in eliminating the troubles experienced from rust-choked services. There are few instances to-day where lead piping is used solely for gas services, but Blackpool adopted this material many years ago, and with the Dri-Gas Process it is astonishing how few complaints have been received.

During the past three years, since the plant has been in operation, we have only had, on an average, 46 service complaints of every kind per annum out of some 31,000 services, and more than half were due to rust in wrought-iron pipes laid some 30 years ago. There have been no renewals required of lead services The services, I might say, are laid in wood troughing and it can be quite understood that with lead there are no troubles with rust."

(From the "Gas Salesman," January issue)

Plants now Building

PLYMOUTH
BRIGHTON
TONBRIDGE
NOTTINGHAM
MARGATE
METROPOLITAN GAS CO.
(Melbourne, Australia)

We shall be pleased to furnish further evidence of the benefits of Gas Drying supplied by Engineers and Undertakings to whom some of our 80 installations have been supplied.

HOLMES
FOUNDED 1850
HUDDERSFIELD

IN THE ABOVE CASE ONLY ONE SERVICE COMPLAINT WAS REGISTERED FOR EACH 28 MILLION CUBIC FEET OF GAS DISTRIBUTED

W. C. HOLMES & CO. LTD., HUDDERSFIELD

Telephone: Huddersfield 1573 (Private Branch Exchange).
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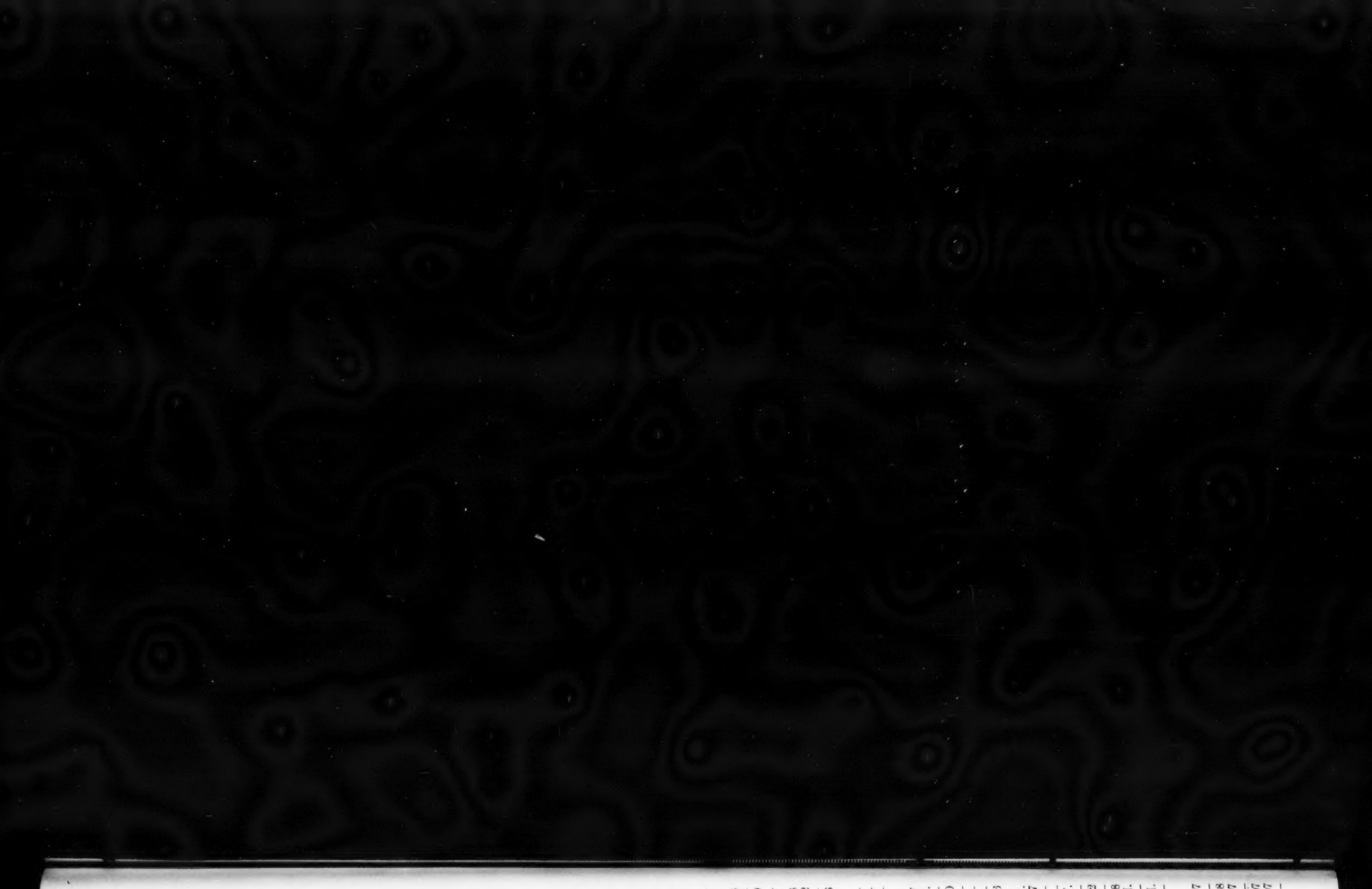
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